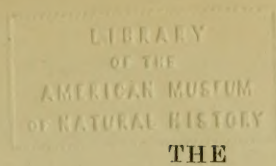


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JOURNAL

59.06(59.3) a

OF THE

9a

Natural History Society of Siam.

Vol. III.

Comprising Five Parts and containing Ten Plates.

Edited by

Malcolm Smith and W. J. F. Williamson.

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LIST OF MEMBERS ON 31st. DECEMBER, 1919.

ADDENDA AND CORRIGENDA.
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NOTE.—In counting lines, page-headings and foot-notes are not included.

- P. 77, line 1. For "*siana*" read "*siarma*".
- P. 103, lines 6 and 7 from bottom. For "*fuliginona*" read
"fuliginosa".
- P. 116, line 2 from bottom. For "*melanocephalius*" read
"melanocephalus".
- P. 117, „ 8. For "*Eulables*" read "*Eulabes*".
- P. 137, „ 11. For "*Secotophilus*" read "*Scotophilus*".
- P. 167, „ 16. For "*Tautataus*" read "*Tautatus*".
- P. 188, „ 14. For "*Timalia*" read "*Timelia*".
- P. 194, „ 4. For "ccxxvii, p. 10" read "ccxxviii, p. 15".
- P. 195, „ 6 from bottom. For "Kloss" read "Kloss's".
- P. 196, „ 11 from bottom. For "*cinnamomeoventris*" read
"cinnamomeoventris".
- P. 225, „ 1. For "Pan" read "Pang".
- P. 333, „ 5. For "*indochinuesis*" read "*indochinensis*".
- P. 354, „ 13 from bottom. For "*cruesmanni*" read "*crusemanni*".
- P. 376, „ 4. For "Woughton" read "Wroughton".
- P. 412, „ 11. For "*Dendrognathus*" read "*Dendronanthus*".
- P. 414, „ 14 from bottom. For "*rhizophorce*" read "*rhizophore*".
- P. 423, „ 4. For "*jugulareis*" read "*jugularis*".
- P. 424, „ 3. For "*perlatus*" read "*perlutus*".
- P. 437, „ 6 from bottom. For "*Trogon*" read "*Trogon*".
- P. 438, lines 5 and 6. For "Pyrotrogon" read "Pyrotrogon".
- P. „ „ 11 and 12. For "*sparveroides*" read "*sparverioides*".
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PROCEEDINGS OF THE SOCIETY.

2ND ORDINARY GENERAL MEETING, 1919.

This was held on the 8th August, 1919, and was attended by 16 members and 6 guests.

The President informed the members that he had received an enquiry from Messrs. Robinson and Kloss of the F. M. S. Museums, who were compiling a series of papers on the Vertebrates of Siam, whether the Society would care to publish the papers as part of the Journal, the F. M. S. Museums contributing to the costs of publication, and that the Editors of the Journal were considering the matter.

Mr. E. G. Herbert then read a paper on the breeding of larks and pipits near Bangkok, specimens of the birds and their eggs being exhibited by him. He also exhibited a new variety of pheasant obtained by Mr. K. G. Gairdner.

Dr. Smith exhibited a new genus of sea snake from Singora as well as other sea snakes and a collection of flying lizards. Mr. W. J. F. Williamson exhibited the eggs of certain terns with specimens of the birds.

STATEMENT OF ACCOUNTS FOR 1918.

RECEIPTS		EXPENDITURE	
	Ticals		Ticals
Balance from 1917 ...	514.43*	Production of Journal :—	
Subscriptions ...	1,230.55	On a/c of Vol. II. No. 3	24.38
Journals sold ...	175.84	" " " " II. " 4	138.00
Interest on Balance at Bank ...	7.17	" " " " II. " 5	199.80
		" " " " III. " 1	354.44
		" " " " III. " 2	290.00
			—1,006.62
		Postage ...	82.71
		Printing and Binding ...	26.90
		Stationery ...	4.00
		Hire of room for General Meetings ...	15.00
		Purchases for Library ...	61.53
		Amount on deposit with Messrs. Thacker, Spink & Co., Calcutta ...	25.00
		Balance at Bank ...	706.23
	<u>1,927.99</u>		<u>1,927.99</u>

Bangkok,

21st January, 1919.

S. H. COLE,

Hon. Secretary and Treasurer.

* Including amount on deposit with Messrs. Thacker, Spink & Co.

STATEMENT OF ACCOUNTS FOR 1919.

RECEIPTS.		EXPENDITURE	
	Ticals		Ticals
Balance from 1918 ...	731.23*	Production of Journal:—	
Subscriptions ...	1,040.00	On a/c of Vol. III No. 2	139.69
Journals sold ...	27.00	„ „ „ III „ 3	527.99
Interest on Balance at		„ „ „ III „ 4	549.00
Bank ...	11.95		—1,216.68
		Postage ...	136.35
		Printing and Binding ...	89.80
		Stationery ...	11.00
		Hire of room for General	
		Meetings ...	10.00
		Amount on deposit with	
		Messrs. Thacker, Spink	
		& Co., Calcutta	25.00
		Purchases for Library ...	19.43
		Balance at Bank ...	301.92
	<u>1,810.18</u>		<u>1,810.18</u>

Bangkok,

S. H. COLE,

25th January 1920.

Hon. Secretary and Treasurer.

* Including amount on deposit with Messrs. Thacker, Spink & Co.

LIST OF MEMBERS ON 31ST DECEMBER, 1919.

Aggaard, C. J.	Joynson, H. W.
Ardron, G. H.	Lambert, S. G.
Ayer, Ira, M. D., Dr. P.H.	Lloyd, Mrs. W. F.
(Penn) & Capt. O.R.C., U.S.A.	Lyle, Mrs. T. H.
Bain, W.	Mackenzie, J. M. D.
Barnes, Dr. M. E.	Macleod, G. G.
Barron, P. A. R.	McBeth, J. J.
Braham, N. C.	Mountain, A. W.
Brewitt-Taylor, L.	Nystrom, F.
Buszard, Mrs. M. F.	Ogilvie, A. W.
Butler, T. S.	Pegg, H. F.
Cable, J. A.	Phongse Sanitwongse, Mom Luang
Cambiaso, Count F.	Queripel, A. L.
Chapple, E.	Robert, Dr. L.
Cole, S. H.	Slack, T. A.
Collins, Mrs. D. J.	Smith, E. Wyon
Gairdner, K. G., C.M.Z.S.	Smith, M. A., M.R.C.S., L.R.C.P., F.Z.S.
Gayetti, Dr. C.	Spencer, F. D.
Godfrey, E. J., B. Sc., F.E.S.	Spigno, A. B.
Gore-Browne, H.	Trotter, E. W.
Gould, A.N.	Walsh, H. C.
Groundwater, C. L.	Webb, G. E., B.A.
Groves, Mrs. S. P.	Weston, C. M.
Grut, W. L.	Williamson, W. J. F., C.M.G.,
Healey, E.	F.Z.S., M.B.O.U.
Herbert, E. G., C.M.Z.S.	Winit Wanadorn, Luang
Hogge, C. E. W.	
Jagd, H.	

HONORARY MEMBERS.

H. R. H. The Prince of Chumporn	
Baker, E. C. Stuart, F.Z.S., M.B.O.U.	Gyldenstolpe, Count Nils, B. A.
Kloss, C. Boden, F.R.G.S., F.Z.S., M.B.O.U.	
Robinson, H. C., C.M.Z.S., M.B.O.U.	

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Volume III.

BANGKOK.

Number 1.

SOME NOTES ON CERVUS (RUCERVUS) SCHOMBURGKI.

By P. R. KEMP.

WITH A PLATE.

This deer is one of the rarest and least known of the Rucervine group of the family Cervidae, and should be of particular interest to members of this Society, since Siam is essentially the country in which it is to be found.

The first record of this deer occurs in 1863 when Blyth described the species in the Proceedings of the Zoological Society, page 155. In that, or the previous year, a Siamese Embassy had been in London, and had presented a pair of loose horns, and odd right and left horns, of this deer, to Her Majesty Queen Victoria,* by whose command they were made over to the South Kensington Museum.

Blyth when exhibiting these horns before the Zoological Society, considered them to belong to an undescribed species of deer, "probably inhabiting Siam," and he gave the species the name *Cervus* or *Rucervus schomburgki*, "in compliment to his distinguished friend, Her Majesty's representative at the Court of Siam," who was then Sir Robert Schomburgk. Blyth had seen a similar pair of horns before in Calcutta, in the possession of a sailor, who was, however, unable to give him any information about their origin, and he had put them down as a remarkable variety of horn of the *Rucervus duvauceli*, the "barasingha" of India, with which he was quite familiar.

* This is somewhat remarkable, in view of the fact that the Siamese of today place no value whatever upon the horns of this deer. Eds.

The occurrence, however, of these additional horns presented by the Siamese Embassy, which were certainly brought from Siam, induced him to believe that they indicated a distinct species, separated widely in its geographical range from the *Rucervus duvauceli*, which was quite unknown in Siam.

In 1865 two fine pairs of horns of *Cervus schomburgki* were purchased for the British Museum from a miscellaneous collection of objects of Natural History procured in Siam, and brought home by Sir R. Schomburgk and auctioned after his decease.

Blyth exhibited photographs of these and other horns in the P. Z. S. 1867, page 835, and at the same time he makes mention of "having been assured that a living buck of the species is at this time living in the Jardin des Plantes at Paris."

He also mentions in this paper the fact that two of the heads exhibited had the brow time forked.

Sir Victor Brooke, F. Z. S., writing nine years later (P. Z. S., 1876, p. 304), mentions having received further specimens of the horns of *Cervus schomburgki*, and states that "all specimens were procured in northern Siam, probably even in the tributary states named Laos and Shan," basing his statement upon the opinion of Dr. Campbell, the resident Medical Officer of the British Consulate at Bangkok, with whom he had corresponded on the subject.

Brooke also refers to "an adult stag mounted in the gallery of the Muséum d'Histoire Naturelle at Paris" which had been sent from Siam by M. Bocourt, and which is "that mentioned by Mr. Blyth (P. Z. S. 1867, p. 835).

In the P. Z. S. 1872, p. 798, further mention is made of a living specimen of the *R. schomburgki* in Shanghai. This animal, it was stated, was presented to a European by the King of Siam.

In 1873 the Zoological Gardens in London procured by exchange from the Zoological Gardens of Hamburg, a buck deer which was identified as *Cervus duvauceli*. In 1877, however, it was suggested that this deer was really a specimen of *Cervus schomburgki* and its origin was then traced back. It was found to have been bred in captivity in the Hamburg Zoological Gardens between a male, said to have come from Bangkok in 1862, and a female received from Berlin, which was also believed to have come from Siam. (P. Z. S., 1877, p. 682).

During the next twenty years I can find no record of this deer, but in 1897 a live male specimen was procured in Siam, having been caught by Phya Rachavarinth, the Governor of Saraburi, "somewhere on the Korat plains."

This deer was given to Mr. Passmore, who was at the time stationed at Saraburi in charge of the railway construction, and was sent down by him to the late Mr. Bethge, the Director General of the railway. The latter went home to Germany in 1898 and took the deer, with other living specimens of the fauna of the country, for presentation to the Berlin Zoological Gardens.*

Neither Mr. Passmore nor Mr. Bethge realized the value of the find, and were considerably surprised when they later heard that the animal was a very rare one, and—erroneously, it would appear—the first ever caught and brought to Europe. It is said that Mr. Bethge was seriously annoyed at having to pay ticals 21 for railway charges for the animal's transport to Bangkok.

The rarity of the find was such that Messrs. Jamrach sent out, in about the year 1905, a special collector to endeavour to capture another living specimen. This collector, Mr. Chance, spent several months in the Korat district attempting to net this deer, but was not successful in obtaining a specimen either dead or alive, although he was more fortunate with *Cervus eldi* which is comparatively common.

Mr. Chance had in his possession photographs of the deer, which I imagine, must have been taken of the animal sent to Germany.

Cervus schomburgki undoubtedly belongs to the same group as *Cervus duvauceli*, the "barasingha" or swamp deer of India, and *Cervus eldi*, the "lamang" of Siam, or "thamin" of Burma.

The following full description of the species, taken from Lydekker's Catalogue of Ungulates, 1915, must, I think, have been taken from a study of one of the living animals in captivity in Europe, or from the mounted specimen in Paris.

"Typical locality:—Siam.

"Height at shoulder about 3' 5"; coat in winter rather long and coarse; general colour uniform brown, darkest on nose and the upper surface of tail, and lightest on cheeks and flanks; under parts, under surface of tail and lower lip whitish;

*Mention of this animal is made in P. Z. S. 1900, p. 303.

a tinge of rufous on upper lip, back of head and limbs; hair on front of lower part of forelegs elongated into a fringe; metatarsal gland not described; antlers, large, complex, smooth and polished; the brow tine very long, frequently forked, and arising nearly at a right angle to beam, the latter very short and more or less laterally compressed, then forking dichotomously with each of the main branches about equally developed, and again forking in a similar manner to terminate in long cylindrical tines; in immature antlers hind branch of main fork less developed than front one. Good antlers measure from 27 to 33 inches in length along the front curve with a basal girth of from $4\frac{1}{2}$ to 6 inches and a tip to tip interval of $9\frac{1}{2}$ to $28\frac{3}{8}$ inches."

The range over which the animal is found is, according to Rowland Ward (Records of Big Game, 1914 p. 57) :—

"Siamese territory east and west of the Menam River; also Cambodia west of the Menam River south of Paknam Po and in swamps occasionally on east; in fact, the inland districts of the Menam River in northern Siam."

This statement shews a good deal of geographical confusion as to the position of Cambodia. The Menam River is of course the river Chao Phraya, the term Menam, or Mother of Waters, being used in Siam to designate any large river.

Lydekker states that the range includes Yunnan, and Blanford gives the Shan States as a locality in which this animal is found.

In my opinion, this deer is not found anywhere in the valley of the Menam Chao Phraya proper at the present day, though, doubtless it was found in the vicinity of Paknam Po twenty years ago, before the railway opened the country up.

Some two or three years ago when I was in the Paknam Po district, some old residents told me that they remembered this deer, which they described as resembling the "lamang" (*Cercus eldi*) but with more complex and multi-tined antlers.

They stated that the animal was known to them as "saman" (สมัน) and was frequently found some twenty years ago running with 'lamang' in the open and rather swampy country east of Paknam Po in latitude $15^{\circ} 30' N$, and longitude $100^{\circ} 30' E$. They also asserted,

and this statement I have heard elsewhere in other districts, that the "saman" are always males, but that they breed with the "lamang," and their young, when males, may carry antlers of either description, "lamang" or "saman."

This statement rather points to the deduction that the female *Cervus schomburgki* closely resembles the female *Cervus eldi*.

H. B. M. Consul-General in Bangkok, Mr. Lyle, also informs me that he remembers seeing antlers of this species many years ago in native houses along the Menam Chao Phraya between Paknam Po and Utaradit.

I spent three years in the province of Pitsanulok some sixteen years ago but I never came across or heard of this deer, though I shot "lamang" in the southern part of the district.

During the last three or four years I have been several times in the districts both east and west of Paknam Po, and it would seem that the settlement of this country in the last twenty years has driven all game away from the more open country. It was not until I got on to the Menam Sak to the east, in the Bua Chum district, that I could pick up any news of the recent appearance of *Cervus schomburgki*. At Bua Chum, a village on the east bank of the Menam Sak, in latitude 15° 15' N longitude 101° 10' E, I ascertained that antlers were occasionally brought in for sale to the Chinese who trade up and down the river. I could, however, get hold of no one who had actually shot or seen this animal, but its existence in the district was generally recognized. The animal was known to the Laos as "la-ong" (ละออง), and "saman" (ส้มมัน) would appear to be the Siamese name for this animal. It was said to be rather lighter in colour and somewhat smaller in size than the sambar.

In 1917 I was in the Korat district and made further enquiries there, with much the same result. At Sung Nern I gathered from an old inhabitant that he remembered a deer called "la-ong" which had formerly been occasionally seen and shot but, since the advent of the railway, he had not seen or heard of this animal anywhere in the district, although he believed it was found "up north." This locality would correspond to latitude 16° longitude 102°, the Chaiyapum district of Korat.

In Bangkok "skin and horn" shops, the antlers of *Cervus schom-*

burgki are frequently seen, but whether from recently killed animals or not I cannot say. Enquiry generally elicits the information that they came from Korat, and this is most probably the case, though some certainly come from the Menam Sak district as mentioned above.

In my opinion *Cervus schomburgki* is an even rarer animal than is generally believed, and its habitat, at any rate as far as Siam is concerned, limited to a small area formed by the quadrilateral contained between latitudes 15° and 17° N, and longitudes 101° and 103° E. It is certainly not now found in Siam west of longitude $100^{\circ} 30'$ and I cannot learn of its existence in the province of Ubon, the most easterly part of Siam.

Mr. Lyle, who has travelled very extensively over Siam, and who has always been an observant naturalist as well as a keen shikari, assures me that it is not found in the north of Siam, say above latitude 18° , and he also much doubts the existence of the species in the Chantabun district. The area, therefore, within which the deer is found is practically limited to the above mentioned quadrilateral which, unfortunately, is a district never visited by Europeans.

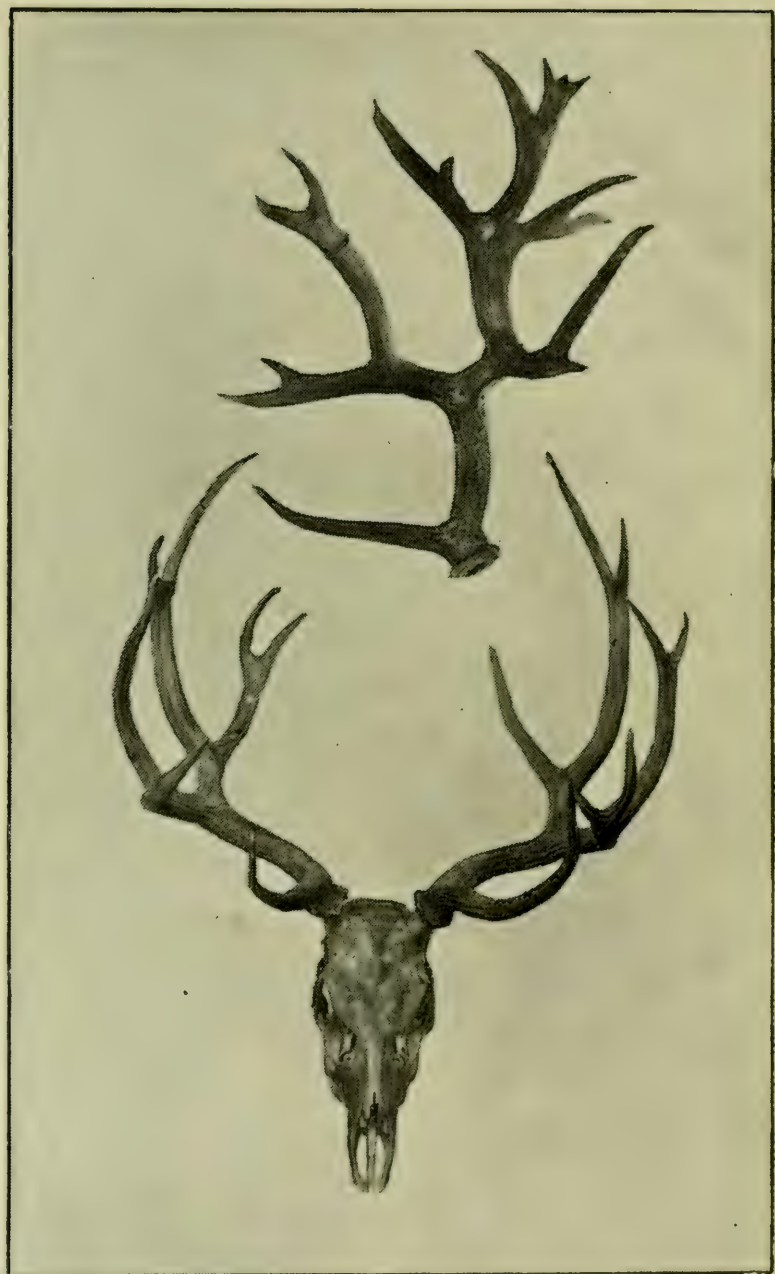
The country contained in this area is open, very sparsely settled, and in the rains swampy. The approximate elevation above mean sea level would be about 1,000 feet.

Whether this deer is found in any of the countries bordering on Siam is a point upon which I can find very little reliable information.

All the specimens (antlers) in the British Museum, and in the Bombay Natural History Society's Museum, as well as all recorded in Rowland Ward's "Records of Big Game," have come from Siam, and I cannot find any mention of specimens having been procured elsewhere, with the single exception of a pair of antlers figured in Bentham, Asiatic Horns and Antlers, Ind. Mus., 1908, p. 88, as collected by John Anderson in 1878 in the Sunda Valley, Western Yunnan.*

Rowland Ward states that the deer is found in Cambodia, but I do not know his authority for this statement unless it was Gray, who in his Catalogue of Ruminants, Brit. Museum, 1872, describing a frontlet and antlers from Cambodia (*Cervus cambodjensis*), identified it

* The town of Sunda is about 50 miles E. N. E. of Bhamo, on a river running into the Irrawadi at that town.



Cervus schomburgki

with *Cervus schomburgki*, though afterwards this specimen was recognized as belonging to *Cervus unicolor equinus* and entered under same.

I append measurements of some horns I have collected :—

Head belonging to	Length on outside curve	Circum- ference.	Tip to tip	Width inside	Points
1. British Museum ... (Record Head)	33"	5 $\frac{3}{4}$ "	17 $\frac{1}{4}$ "	—	9 + 11
2. E. G. Loder ...	32 $\frac{1}{8}$	5 $\frac{1}{8}$	—	—	12 + 11
3. Bombay Nat. Hist. Soc. ...	30 $\frac{1}{2}$ 31 $\frac{1}{2}$	6 $\frac{1}{2}$ 6 $\frac{1}{2}$	24	27 $\frac{1}{2}$	10 + 13
4. E. W. Trotter (Siam) ...	20 $\frac{7}{8}$	5 $\frac{3}{8}$	13 $\frac{1}{4}$	25 $\frac{1}{2}$	7 + 7
5. E. W. Trotter (Siam) ...	30 $\frac{3}{4}$	5	15 $\frac{1}{4}$	21 $\frac{7}{8}$	8 + 9
6. British Museum ...	30 $\frac{1}{8}$	5	15 $\frac{5}{8}$	33	10 + 10
7. British Museum ...	29 $\frac{3}{4}$	4 $\frac{3}{4}$	28 $\frac{3}{8}$	31 $\frac{5}{8}$	10 + 11
8. Bombay Nat. Hist. Soc. ...	29 $\frac{1}{2}$ 30	3 $\frac{1}{2}$ 5 $\frac{1}{2}$	15	28 $\frac{1}{4}$	7 + 8
9. E. W. Trotter (Siam) ...	28 $\frac{1}{4}$	5 $\frac{3}{8}$	15 $\frac{3}{4}$	20 $\frac{1}{8}$	8 + 7
10. Malcolm Smith (Siam) ...	27 $\frac{3}{8}$	5 $\frac{5}{8}$	—	—	15 +

All from Siam and, I believe, all procured by purchase, since, to the best of my knowledge, no European has ever shot one of these animals.

Nos. 3 and 8 were presented in 1897 to the Bombay Natural History Society by, respectively, Messrs. A. J. A. Jardine and H. Slade. No. 8 used at one time to hang in the Borneo Company's bungalow at Raheng and would have been most probably procured at Paknam Po, or in that district.

No. 10 is a single right-hand horn and is remarkable for the large number of points it carries. This horn is shewn in the illustration accompanying this article, the lower head being also the property of Dr. Smith, having been selected, in spite of its somewhat smaller size, owing to its having the skull as well.

In all the numerous heads examined by me I have never come across a single case of the forked brow tine of which Blyth and Lydekker make mention, nor can I learn of other observers in this country having ever met with this peculiarity.

Another noticeable point is that antlers which can be procured in Bangkok at the present day very seldom carry more than 7 or 8 points, whereas the antlers recorded twenty years ago or more, frequently carried as many as 10 or 12 points.

In conclusion I would state that the authorities of the British Museum of Natural History are most anxious to procure a specimen of this deer; at present they have only skulls and horns. In 1909 and again in 1914 they approached the British Legation in Bangkok to endeavour to obtain for them a complete skin and skeleton, and offered £50 to meet expenses in connection therewith. On the outbreak of war, however, this grant was withdrawn.

If any member of this Society should at any time be in a position to obtain this animal, either alive or dead, or even a portion of its skin or skeleton, he should make every endeavour to do so. For it would seem that this deer is on the verge of extinction and it would be a thousand pities if it were to be lost to science, before a complete record could be made of it.

In the preparation of this paper I have to acknowledge with thanks assistance from Dr. R. Hanitsch, the Director of the Raffles Museum, Singapore, in particular; also from Mr. C. Boden Kloss of the Selangor Museum, Kuala Lumpur, and the authorities of the British Museum, and the Bombay Natural History Society's Museum.

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- 1876 Brooke, Proc. Zool. Soc., London, p. 304.
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1907 Ward, Records of Big Game, ed. 5, p. 88.
1908 Bentham, Asiat. Horns and Antlers, Ind. Mus., p. 88.
1910 Ward, Records of Big Game, ed. 6, p. 75.
1914 " " " " " ed. 7, p. 57.
1915 Lydekker, Catalogue of Ungulates, vol. iv, p. 97.

Owing to difficulties in printing, the plates for issue with this number are not yet ready. They will be issued later.

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- 1872 Gray, Cat. Ruminants Brit. Mus., p. 76.
 1873 Gray, Hand-list Ruminants Brit. Mus., p. 145.
 1873 Lydekker, Horns and Hoofs, p. 307.
 1876 Brooke, Proc. Zool. Soc., London, p. 304.
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DESCRIPTION OF A NEW FROG, (*RANA MIOPUS*) FROM SIAM.

By G. A. BOULENGER, LL.D., F.R.S.

(Published by permission of the Trustees, British Museum).

Dr. Malcolm Smith has recently recorded *Rana humeralis* Boulenger, from Siam (Khao Wang Hip and Nakon Sitamarat), and has been so kind as to send me one of the specimens, an adult female from the latter locality. I first thought I could confirm his identification, but a more careful comparison, which I have just made, with types of *R. humeralis* has convinced me that the Siamese frog is specifically distinct, and I propose for it the name *R. miopus*.

R. miopus differs from *R. humeralis* in the shorter limbs, the tibio-tarsal articulation reaching only the centre of the eye; the tibia is a little less than half the length from snout to vent, and the hand and foot are shorter, as may be seen from the following measurements of female specimens of the same size (1, Tienzo, Upper Burma; 2, Nakon Sitamarat). The toes are less fully webbed, two phalanges of the fourth being free; the proportions of the fingers are different; the loreal region is more oblique, and the interorbital region is a little narrower than the upper eyelid.

Measurements, in millimetres.	1.	2.
From snout to vent.....	73	73
Head	24	25
Width of head	24	25
Snout	10	9
Eye	8	8
Interorbital width	5	5
Tympanum	5.5	6
Fore limb.....	50	46
1st finger.....	11	11
2nd „	10	8
3rd „	15	12
4th „	11	7
Hind limb.....	127	108
Tibia	40	35
Foot.....	43	33
3rd toe.....	25	16
4th „	36	27
5th „	27	18

The specimen of which measurements are given is greyish above, with pink patches on the back, sides, and limbs, and with large blackish blotches on the back; limbs with rather indistinct dark cross-bands; hinder side of thighs black, speckled and vermiculated with white. Dr. Malcolm Smith says the male agrees in the coloration with my description of *R. humeralis*, and from the fact that it was referred to that species we may assume that it possesses the same secondary sexual characters.

DESCRIPTION OF A NEW SNAKE (OPISTHOTROPIS
SPENCERI) FROM SIAM.

BY MALCOLM A. SMITH, F.Z.S.

WITH A PLATE.

Diagnosis. Scales in 17 rows, nasals separated by the internasals, praefrontal single, loreal in contact with the internasal, 7 supralabials, 4th and 5th touching the eye. Nearest to *O. maxwelli* Boulenger, from South Fokien, China, and *O. atra* Gunther, said to be from West Africa, from both of which it differs in a number of small points.

Description. Snout broadly rounded, much depressed; nasal almost completely divided by a cleft running from the internasal to the 1st labial; rostral nearly twice as broad as deep, well visible above; internasals subtriangular, about as broad as long; praefrontal single, large, two and a half times as broad as long; frontal large, slightly longer than broad, as long as its distance to the rostral, nearly four times as broad as the supraocular; loreal a little longer than deep, in contact with the internasal; one prae- and two postoculars; temporals 1+2 or 2+2; seven supralabials, 4th and 5th touching the eye; five infralabials in contact with the chin-shields, the anterior pair of which are larger than the posterior.

Scales in 17 rows throughout, entirely smooth. Ventrals 183, anal divided, subcaudals 33 (?).

Colour. Olive above, pale yellowish beneath, the colours mingled on the three outer rows of scales.

Total length, 600 mm.; tail (imperfect) 72.

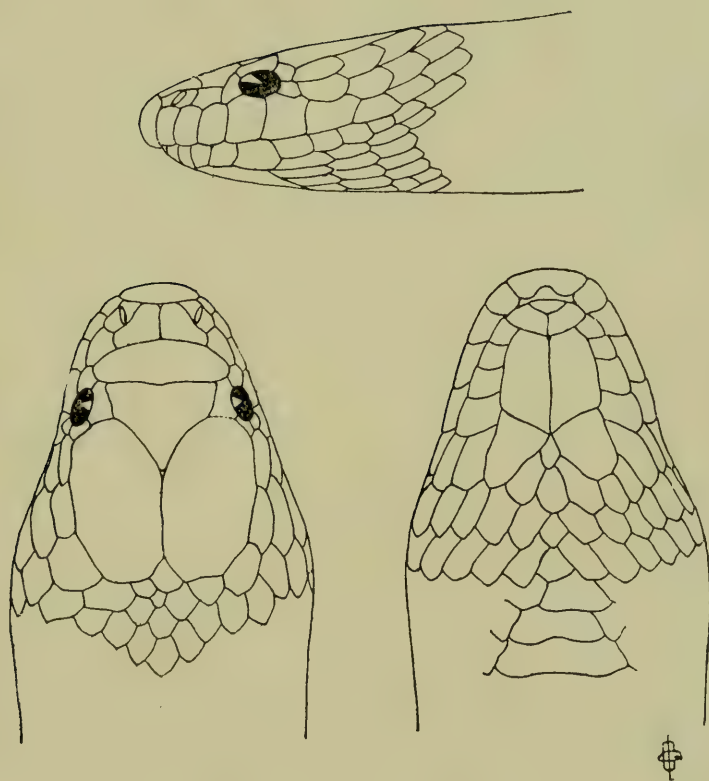
Dentition. Maxillary, 25; palatine, 14; pterygoid, 18; mandibular, 22.

Type. Female; author's number, 1178, M. A. S., collected September, 1917, in Muang Ngow, N. Siam.

This new species is described from a single specimen, which was obtained in a hill stream at about 300 metres elevation by Mr. F. D. Spencer, after whom I have much pleasure in naming it.

The type will be presented to the British Museum of Natural History, London.

I am indebted to Mr. C. L. Groundwater for the drawing of the head.



Opisthotropis spenceri

NEW OR NOTEWORTHY BIRD-RECORDS FROM SIAM.

By W. J. F. WILLIAMSON, F.Z.S., M.B.O.U.

Of the birds mentioned in the following list, the majority do not appear to have been recorded from this country before, while the remainder are worthy of note by reason of the length of time which has elapsed since they were last obtained, the considerable extension of their local range, or other circumstance. The new records, 38 in number, are marked with an asterisk (*).

The specimens obtained at Bangnara, Peninsular Siam, and in

ERRATA.

P. 15, line 7, for "38" read "35."

P. 24, line 15, remove the asterisk in front of "28."

P. , , , add after line 22 :—

I can trace only one previous record from Siam, viz., that of Ogilvie-Grant from Nawngchik, Patani, Peninsular Siam, *vide* Fasc. Malay., Zool. iii (1905), p. 75.

~~I have to record my thanks to~~ MR. H. C. ROBINSON, Director of Museums and Fisheries, Federated Malay States, for kindly assisting me to identify several of the birds in this list.

The following abbreviations are used :—T. L.=Total length (in the flesh). W=Wing. T=Tail.

Family *CORVIDÆ*—*Crows, etc.*

- *1. *Machlolophus sphenotus* (Blyth). *The Black-spotted Yellow Tit.*

My collector obtained a specimen on Doi Nga Chang, a hill near Lampang, Northern Siam, at a height of 3,500 ft., in February 1917.

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Of the birds mentioned in the following list, the majority do not appear to have been recorded from this country before, while the remainder are worthy of note by reason of the length of time which has elapsed since they were last obtained, the considerable extension of their local range, or other circumstance. The new records, 38 in number, are marked with an asterisk (*).

The specimens obtained at Bangnara, Peninsular Siam, and in various localities in the north of the country, were procured by my collectors, and the measurements of total length (where given) are as noted by them. The wing-measurements are my own, and in making them I have followed the method advocated by Hartert (Nov. Zool. XXIV., p. 271, footnote), *i.e.*, to flatten the wing against the rule and thus stretch it out to its fullest extent. Hartert holds that, by measuring in this manner, greater accuracy and uniformity are obtained than by allowing the wing to retain its natural curve. With this view I am inclined to agree, as the slightest pressure causes the tip of the wing to flatten somewhat and thus increases the measurement, at times unwittingly. Seeing, however, that both methods are in use, it is necessary to state that the one here followed adds 1 or 2 millimetres to the length of the wings of even the smallest birds—and, of course, more for the larger ones. It is a pity that a uniform system of measuring has not been generally adopted.

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The following abbreviations are used :—T. L.=Total length (in the flesh). W=Wing. T.=Tail.

Family CORVIDÆ—Crows, etc.

- *1. *Machlolophus spilonotus* (Blyth). *The Black-spotted Yellow Tit.*

My collector obtained a specimen on Doi Nga Chang, a hill near Lampang, Northern Siam, at a height of 3,500 ft., in February 1917.

Dr. Malcolm Smith, whom my collector was accompanying on this occasion, informs me that the hill is covered with pines at that altitude. The specimen is, unfortunately, a mummy, as the bird was shot on the last day of the trip, and, there being no time to skin it, was injected with formalin. It is an immature individual, with the forehead, lores, sides of head, nape-patch and longer feathers of the crest greenish yellow instead of bright yellow, but I think there is little doubt of the correctness of the identification. W. 69 mm.

Family *CRATEROPODIDÆ*—*Laughing-Thrushes*, &c.

2. *Dryonastes strepitans* (Blyth). *Tickell's*

Laughing-Thrush.

Garrulax strepitans, Faun. Brit. Ind., Birds, i (1889), p. 83.

Dryonastes strepitans, Gyldenstolpe, 1916, p. 55.

Mr. K. G. Gairdner obtained a male at Si-sawad, Western Siam, in May 1915, at a height of 900 metres. This was identified by the British Museum, and is worth recording as the only others so far reported were procured by Gyldenstolpe in Northern Siam.

(Iris crimson. Bill, legs and feet dark brown. Claws light silvery horn. A considerable area of naked orbital skin black, with a bluish patch beneath the eye, probably hidden in life. Shot out of a flock. K.G.G.)

*3. *Pomatorhinus ochraceiceps* Walden. *Lloyd's*

Scimitar Babbler.

2 ♂, 1 ♀. Muang Wang, Northern Siam, September, October and November 1917.

Males. T.L. 242, 245 mm. W. 93, 93.

Female. T.L. 220 mm. W. 88.

*4. *Pomatorhinus olivaceus ripponi* Harrington. *The Shan States Scimitar Babbler*.

1 ♀. Doi Nga Chang, Lampang, Northern Siam, 4,500 ft., February 1917. W. 85 mm.

2 ♀. Muang Wang, Northern Siam, October and November 1917.

T.L. 203 mm. W. 83. (The second specimen has been presented to the F.M.S. Museums, and its measurements are not available).

Family *TIMELIIDÆ*—*Babblers*.

*5. *Setaria magna magna* (Eyton). *The Large Red-headed Tree-Babbler*.

Malacopteron magnum (part.), Faun. Brit. India, Birds, i (1889), p. 151.

1♂. Bangnara, Peninsular Siam, July 1916.

T.L. 189 mm. W. 87.

*6. *Setaria magna cinerea* (Eyton). *The Small Red-headed Tree-Babbler*.

3♂. Bangnara, Peninsular Siam, July 1916.

T.L. 162, 173, 175 mm. W. 77, 80, 72.

*7. *Macronus ptilosus* Jard. and Selby. *The Red-headed Black-throated Babbler*.

2♂, 6♀. Bangnara, Peninsular Siam, July and August 1916.

Males. T.L. 164, 169 mm. W. 69, 69.

Females. T.L. —, —, 155, 165, 166, 170 mm. W. 66, 68, 65, 67, 64, 68.

*8. *Stachyris nigricollis* (Temm.). *The Rufous-backed Black-breasted Babbler*.

1♂, 3♀. Bangnara, Peninsular Siam, July and August 1916.

Male. T.L. 165 mm. W. 71.

Females. T.L. 159, 161, 166 mm. W. 69, 69, 71.

*9. *Timelia pileata jerdoni* Walden. *Jerdon's Red-capped Babbler*.

Timelia pileata (part.), Faun. Brit. India, Birds, i (1889), p. 132.

H. R. H. the Prince of Chumpon obtained a specimen in May 1915 at Angthong, Central Siam, while my collectors procured a second at Chiengmai, Northern Siam, in June 1917 and two others at Sriracha, in the South-eastern division, in December 1917. Subsequently, in January 1918, while on a collecting trip to Nong Kae, South-western Siam, I obtained three more specimens.

All my birds have been examined by Mr. H. C. Robinson, who has pronounced them to belong to the form described by Walden [Ann. & Mag. Nat. Hist. 4 (x), p. 61 (1872)] from the Khasia Hills. Mr. Robinson remarks that it differs from the true *T. p. pileata*, from Java, "in its generally deeper colour, especially the more chestnut cap,

and in the more noticeable bars on the tail, which are clearly seen in certain lights." This race, as pointed out by Hartert (Nov. Zool. VIII, p. 53), is intermediate between *T. pileata pileata* from Java, and *T. pileata bengalensis* from Northern India. My specimens have somewhat shorter wings than those examined by Hartert, who gives their length as "about 67 mm".

1♂. Chiangmai, Northern Siam, June 1917. W. 65 mm. T. 79.

1♂, 1♀. Sriracha, South-eastern Siam, December 1917.

Male. T.L. 170 mm. W. 63. T. 75.

Female. T.L. 167 mm. W. 62. T. 70.

2♂, 1♀. Nong Kae, South-western Siam, January 1918.

Iris reddish brown. Bill black. Legs brownish olive. Claws horn-colour.

Males. T.L. 177, 179 mm. W. 66, 64 mm. T. 78, 79.

Female. T.L. 178 mm. W. 64 mm. T. 79.

In the Fauna of British India (*loc. cit.*) Oates remarks that this bird is found in Siam, but I have been unable to ascertain on what authority the statement was made, and Mr. H. C. Robinson, whom I have consulted on the matter, writes:—"Technically you are correct as regarding your specimens as the first recorded from Siam proper, though the bird has been obtained from many localities in Burma, within a few miles of the frontier."

*10. *Turdinulus epilepidotus bakeri* Harrington. *Baker's Wren-Babbler*.

2♂, 2♀. Muang Wang, Northern Siam, September and October 1917.

Males. T.L. 112, 112 mm. W. 53, 51.

Females. T.L. 110, 112 mm. W. 53, 51.

11. *Pteruthius aeralatus aeralatus* Tickell. *Tickell's Shrike-Tit*.

1♀. Doi Nga Chang, Lumpang, Northern Siam, February 1917.

1♀. Muang Wang, Northern Siam, September 1917.

T.L. —, 160 mm. W. 77, 80.

The only previous record of this bird which I can trace is that of Robinson [Journ. F.M.S. Mus. V, p. 107 (1915)] who found it com-

mon, above 2,000 ft., on Khao Nawng, a hill in the Bandon district in Peninsular Siam.

Family *PYCNONOTIDÆ*—*Bulbuls*.

*12. *Pinarocichla euptilosa* (Jard. and Selby). *The Crested Brown Bulbul*.

3♂, 2♀. Bangnara, Peninsular Siam, July and August 1916.

Males. T.L. 214, 216, 219 mm. W. 89, 89, 95.

Females. T.L. 209, 221 mm. W. 95, 92.

*13. *Hemixus hildebrandi* Hume. *Hildebrand's Brown-eared Bulbul*.

1♂, 1♀. Muang Wang, Northern Siam, October 1917.

Male. T.L. 215 mm. W. 108. Female. T.L. 205. W. 110.

*14. *Xanthixus flavescens vivida* Stuart Baker. *Blyth's Bulbul*.

1♂. Doi Nga Chang, Lampang, Northern Siam, 4000 ft., February 1917. W. 88 mm.

Family *SYLVIIDÆ*—*Warblers*.

*15. *Megalurus palustris* Horsf. *The Striated Marsh-Warbler*.

Two specimens of this bird were shot by Mr. E. G. Herbert in 1914 at, I believe, Samkok, on the Chao Phya river about 35 miles north of Bangkok, but, by an oversight, the species was not included in the list of new records from Siam published by me in June 1916 in Vol. II of this Journal, pps. 59-65.

I have since obtained a number of specimens, including four in the immediate neighbourhood of Bangkok. It is common at Klong Rangsit, about 15 miles north of the Capital, as well as along the various klongs (canals) in the country to the south and south-east of the city, and I have also seen it by the side of the railway line at least as far north as Paknampo. All these localities are on the east side of the Chao Phya river.

The bird has a striking habit of flying up with rapid beats of the wings to a height of 20 or 30 feet, and then planing down, at an

angle of 45 degrees, with the wings stretched backwards over the body. It has a short song of a few notes, which it generally utters while flying upwards.

3♂. Klong Bangsit, Central Siam, January 1917.

Iris light brown. Mouth blackish to black. Upper mandible dark horny, lower pale horny. Legs brownish flesh.

W. 100, 101, 100 mm. T. 128, 128, 133 mm.

4♂. Bangkok, Central Siam, August and November 1917 and January 1918.

W. 97, 103, 100, 104 mm. T. 105, 129, 131, 130 mm.

Family LANIIDÆ—*Shrikes*.

*16. *Lanius superciliosus* Lath. *The White-browed Shrike*.

1 ♂, 1 ♀. Bangnara, Peninsular Siam, April and May 1918.

Male. W. 87 mm. T. 87. Female. W. 88 mm. T. 84.

Both these birds are in very brilliant fresh plumage and make an exceedingly handsome pair.

*17. *Pericrocotus brevirostris* (Vig.). *The Short-billed Minivet*.

1 ♂, 1 ♀. Doi Nga Chang, Lampang, Northern Siam, 3,500 ft., February 1917.

Male. W. 94 mm. T. 104. Female. W. 92 mm. T. 103.

*18. *Pericrocotus speciosus* (Lath.). *The Indian Scarlet Minivet*.

Mr. K. G. Gairdner shot an immature male (identified by the British Museum) at Sai Yoke, Western Siam, in January 1915.

19. *Hemipus obscurus* (Horsf.). *The Malayan Pied Shrike*.

I have already recorded in this Journal (Vol. II., p. 60) that a specimen was obtained at Bangnara, Peninsular Siam, by Mr. C. J. Aagaard. I have since seen three others from the same locality, of which two were procured by Mr. Aagaard (♂, W. 64 mm., ♀, W. 68) in November 1915, and the third (♀, T.L. 143 mm., W. 65) by my collector in July 1916. The latter also secured another specimen

(♂ imm. T.L. 145 mm., W. 65) at Paknam Chumpon, South-western Siam, in July 1917. The last mentioned locality appears to be the most northerly from which this species has yet been obtained, being in about latitude 10° 35' N.

Family *ORIOLIDÆ*—*Orioles*.

*20 *Oriolus tenuirostris* Blyth. *The Burmese Black-naped Oriole*.

1 specimen (unsexed). Doi Nga Chang, Lampang, Northern Siam, February 1917. This, unfortunately, is also a mummy, having been injected with formalin as there was no time to skin it. W. 148 mm.

Family *MUSCICAPIDÆ*—*Flycatchers*.

*21. *Rhinomyias pectoralis* Salvad. *The Grey-breasted Flycatcher*.

2♀. Bangnara, Peninsular Siam, July 1916.

T. L. 163, 166 mm. W. 75, 68.

Family *TURDIDÆ*—*Thrushes*.

*22. *Cyanecula suecica* (Linn.). *The Indian Blue-throat*.
8♂, 3♀. Bangkok, Central Siam, 26th November 1917 to 4th March 1918.

Males (adult). T. L. 150, 147, —, —, — mm. W. 75, 71, 77, 71, 74.

Females. T. L. 150, —, — mm. W. 73, 69, 68.

Iris dark brown. Bill blackish brown, yellow at gape and at extreme base of lower mandible. Mouth yellow. Legs dusky flesh. Claws dark horn.

Of the above 11 birds, 8 males and 1 female were obtained between the 26th November and 5th December 1917, when the species was quite common in certain places in the suburbs of Bangkok, where the ground was moist. The remaining two birds (both females) were shot in January and March 1918, respectively.

Towards the end of last year there were high floods in the lower portion of the alluvial plain through which the Chao Phya river finds

its way to the sea at the head of the Gulf of Siam, and the country round Bangkok, for a very considerable distance, was accordingly under water for several weeks. I first observed these birds on the 25th November, when the floods were subsiding, and the roads in the suburbs again became usable by pedestrians. In walking along the Wireless Station road that evening, I noticed a number of small brown birds on the ground by the roadside, which struck me as being unfamiliar. They had the regular robin-like quick run for a few feet, with the habit of elevating the tail at the end of each short course. The ditches on both sides, and the fields beyond, were still brimful of water—the former being choked with Java weed. There must have been quite a dozen birds within a space of a quarter of a mile, and they seemed very tame—either flitting on a few yards when I got too near, or circling off over the flooded fields to get back to the road behind. Once or twice they flew on to the packed Java weed, or a roadside bush. I had no gun with me at the time, but the next morning I went there again and obtained four specimens, as well as others on later dates. I also procured three, early in December, on the Racecourse at the Sports Club, where the conditions of the ground, and the proximity of flood water, were similar. The birds obtained in January and March 1918 were shot by my collectors at other places in the neighbourhood, and they reported that they were found on moist ground. Neither I nor my collectors had ever come across the species before. It is, of course, only a winter visitor to this part of the world.

The blue throat of the males (whence the bird gets its English name) is exceedingly attractive, but unfortunately, owing to its ground-feeding habits, this feature cannot be appreciated until a specimen is obtained.

Family FRINGILLIDÆ—Finches.

23. *Emberiza rutila* Pall. *The Chestnut Bunting.*

This species was included by Mr. K. G. Gairdner in his list of birds from the Ratburi and Petchaburi districts (Vol. i., p. 149 of this Journal). As no other collector appears to have obtained it, it may be worth recording that Mr. Gairdner informs me that his specimen (♂) was shot at Sai Yoke, Western Siam, in January 1915, out of a large flock in elephant grass.

Family *HIRUNDINIDÆ*—*Swallows*.*24. *Hypurolepis javanica* (Sparrrn.), ? subsp. *The*
(? *Malay*) *House-Swallow*.*Hirundo javanica* (part.), Faun. Brit. India, Birds, ii (1890), p. 279.2♂. Koh Si Chang and Koh Phai, Inner Gulf of Siam,
May 1918.

2♀. Koh Phra, Inner Gulf of Siam, May 1918.

Males. T.L. 134, 117 mm. W. 106, 105.

Females. T. L. 130, 130 mm. W. 104, 98.

Iris dark brown. Bill black. Legs dark purplish brown.
Claws black.

These specimens were obtained during a short trip down the Gulf, which I made mainly for the purpose of settling the identity of the Swallows which I knew were breeding on one or more of the islands down there. I had previously had eggs sent to me from Koh Phai, in June 1917, and from Koh Phra, in March and April 1918, and on this trip I obtained a clutch of four from the latter island—the nest being in a small cave on the rocky shore. I have no doubt that the eggs belonged to this species. The specimen shot on Koh Phai was flying about in company with *Hirundo rustica gutturalis* (The Eastern Swallow), of which I obtained three examples—all females—but I found no nests there, although it was from this island that I had obtained a clutch the previous year, a month later. At Koh Si Chang and Koh Phai I only observed *Hypurolepis javanica*. When at close quarters, on the wing, it is easily distinguished from *Hirundo r. gutturalis* by its ashy, instead of white or pale chestnut, abdomen.

*25. *Hirundo striolata* Temm. *The Japanese Striated*
Swallow.

1♀. Chiangmai, Northern Siam, June 1917. W. 127 mm.

Family *NECTARINIDÆ*—*Sun-birds*.*26. *Aethopyga sanguinipectus* Wald. *Walden's Yellow-*
backed Sun-bird.

1♂. Muang Wang, Northern Siam, October 1918.

Family *PITTIDÆ*—*Pittas*.

*27. *Pitta nipalensis oatesi* (Hume). *The Fulvous Pitta*.

Pitta oatesi, Faun. Brit. India, Birds, ii (1890), p. 390.

1♂ juv. Muang Wang, Northern Siam, September 1917.

T. L. 190 mm. W. 110.

Mr. H. O. Robinson, to whom the specimen was submitted for opinion, remarks:—"A very young bird, but almost certainly this form." The forehead, crown and hind-neck have whitish shaft stripes; the feathers of the back, rump, scapulars and upper wing-coverts, fulvous to whitish sub-terminal spots; the sides of the head, throat and lower abdomen are whitish with a pink tinge, interspersed with dark brown; and the breast and upper abdomen have terminal whitish spots.

Family *ZOSTEROPIDÆ*—*White-eyes*.

*28. *Zosterops aureiventer* Hume. *Hume's White-eye*.

11♂, 6♀. Meklong, Central Siam, January and February 1918.

Males. T.L. 110—115 (average 111.5) mm. W. 49—54 (average 52).

Females. T.L. (all specimens) 110 mm. W. 51—53 (average 52).

My collector reports that he found this bird very common on coconut palms, which were then in flower.

Family *CAPITONIDÆ*—*Barbets*.

29. *Chotorhea versicolor* (Raffles). *The Many-coloured Barbet*.

5♂, 3♀. Bangnara, Peninsular Siam, October 1915 and July 1916.

Males. T.L. —, —, —, 277, 273 mm. W. 115, 119, 120, 119, 121.

Females. T.L. 279, 271, 269 mm. W. 120, 119, 114 (subad.).

This bird has been recorded by Robinson and Kloss from Trang, which is also in Peninsular Siam (Ibis, 1911, p. 43), but as no particulars are given, the above details may be of interest.

Family *PICIDÆ*—*Woodpeckers*.

30. *Miglyptes grammithorax* (Malh.). *The Fulvous-rumped Barred Woodpecker*.

3♂, 1♀. Bangnara, Peninsular Siam, November 1915 and July 1916.

Males. T.L. —, 185, 184 mm. W. 97, 95, 95.

Female. T.L. 175 mm. W. 97.

Ogilvie-Grant has recorded this bird from Bukit Besar, Nawng Chik, Patani (Fasc. Malay., Zool. iii (1905), p. 98), and Robinson and Kloss from Trang (Ibis, 1911, p. 46). Mr. K. G. Gairdner also obtained a specimen at Sai Yoke, Western Siam, in April 1915 (identified by the British Museum), in evergreen jungle. The last-mentioned record marks a considerable northward extension of the local habitat of the bird—Sai Yoke being in Lat. 14'. 23' N., or about 7 degrees north of Trang. This woodpecker is essentially a Malayan form, and, according to Blanford (Faun. Brit. India, Birds, iii (1895), p. 53), extends northwards into Tenasserim about as far as Tavoy, which (it may be noted) is in approximately the same latitude as Sai Yoke.

Family *CUCULIDÆ*—*Cuckoos*.

31. *Chalcococcyx xanthorhynchus* (Horsf.). *The Violet Cuckoo*.

Chrysococcyx xanthorhynchus, Faun. Brit. India, Birds, iii (1895), p. 221.

Chalcococcyx xanthorhynchus, Ogilvie-Grant, Fasc. Malay., Zool. iii (1905), p. 105; Robinson and Kloss, Ibis, 1911, p. 41.

1♂ ad. Bangnara, Peninsular Siam, August 1916.

T.L. 181 mm. W. 101.

1♂ imm. Bangkok, Central Siam, March 1918.

T.L. 165 mm. W. 99.

Iris lightish brown. Base of bill and gape reddish orange, remainder dusky to dark horn. Mouth reddish orange. Eyelids reddish orange. Legs dusky green. Claws dark horn.

The only previous records I can trace are those of Ogilvie-Grant and of Robinson and Kloss, above-mentioned, and it is to be noted that the specimens concerned were all obtained in various localities in Peninsular Siam. The last named authors say that the species is rare

about 25 miles south-east of Bangkok, a few feet above sea-level, covered with coarse grass, and intersected with canals which finally drain into the head of the Gulf of Siam. There are a few trees at intervals along the canal banks, and round the villages which occur here and there. Until last year I had never observed the bird in the actual vicinity of Bangkok, and it may have been attracted by the flooded condition of the country round the city, to which reference has already been made, *vide* pp. 21 and 22. When in the air, it is noticeable as a dark, heavily-built bird, with a large head and rather short neck.

37. *Butastur indicus* (Gmel.). *The Grey-faced Buzzard-Eagle*.

1 ♀ imm. Rayong, South-eastern Siam, November 1915. W. 320 mm.

1 ♂ ad., 1 ♀ ad. Bangkok, Central Siam, February and March 1918.

Male. T.L. 419 mm. W. 317. Female. T.L. 432 mm. W. 330, Iris yellow. Upper mandible and terminal half of lower black. Base of lower mandible orange-yellow (male), grey (female). Gape and cere orange-yellow. Legs and feet yellow. Claws black.

There appears to be no previous record of the occurrence of this bird in what is now Siamese territory, though Robinson and Kloss procured a couple of specimens in 1907 and the early part of 1909 (*Ibis*, 1911, p. 23), from the Langkawi Islands (on the west coast of the Malay Peninsula), which were then under the suzerainty of Siam. These islands were ceded to Great Britain in the latter of the two years mentioned, together with the State of Kedah, on the adjacent mainland.

38. *Butastur liventer* (Temm.). *The Rufous-winged Buzzard-Eagle*.

1 ♂ imm. Koh Yai (Samkok), Central Siam, July 1917.

T.L. 370 mm. W. 268.

Iris brown. Terminal two-thirds of upper mandible and tip of lower, dark brown; remainder of bill and cere deep yellow. Legs yellow. Claws black.

Blanford (*Faun. Brit. India, Birds*, iii (1895), p. 365) says this species is "found also in Siam"—the other countries mentioned being Burma, Borneo, Java and the Celebes. It does not appear to have

been procured by any recent collector.

*39. *Circus spilonotus* Kaup. *The Eastern Marsh-Harrier.*

1♂. Bangkok, Central Siam, December 1917.

Iris yellow. Bill black, base and gape bluish slate. Cere yellowish green. Mouth bluish slate. Legs bright yellow. Claws black.

2♂. Tachin, Central Siam, January 1918.

T.L. 533, —, — mm. W. 403, 418, 398.

40. *Astur soloensis* (Horsf.). *Horsfield's Short-toed Hawk.*

Accipiter soloensis, Gyldenstolpe, 1916, p. 125.

1♂. Satahip, South-eastern Siam, October 1914.

Iris reddish brown. Cere orange. Bill dark horny, plumbeous at base of upper mandible and dull yellowish horn at base of lower. Legs orange-yellow. Claws black.

T.L. 292 mm. W. 197.

Robinson and Kloss record a specimen (Ibis, 1911, p. 22) obtained on the Langkawi Islands on the west coast of the Malay Peninsula, in December 1907. As already mentioned (*antea*, p. 28), these islands passed out of the possession of Siam in 1909. The authors quoted observe that *Astur soloensis* is very rare in the Malay Peninsula, and the same is evidently the case in this country, as the only specimen hitherto recorded from what is now Siamese territory appears to be that obtained by Gyldenstolpe in Northern Siam.

Blanford (Faun. Brit. India, Birds, iii (1905), p. 400) states that a specimen shot by Bingham had been feeding on lizards and frogs. The stomach of the one obtained by me was full of the remains of insects.

*41. *Accipiter nisus* (Linn.), ? subsp. *The Sparrow Hawk.*

2♀ subad. Bangkok, Central Siam, March and April 1918.

Iris rich yellow. Bill black, bluish grey at base. Cere yellowish green. Mouth bluish slate. Tarsus dull greenish. Feet dull yellow. Claws black. (In the second specimen, the cere was greenish, and the legs and feet pale yellow, with the exception of the tarsus,

which was greenish in front only.)

T.L. 406, 394 mm. W. 252, 242.

Mr. H. C. Robinson, to whom these specimens were submitted, remarks that they are rather too pale for the Himalayan form (*Accipiter nisus melanochistos* Hume) of the ordinary European Sparrow-Hawk, and are probably migrant specimens of some Chinese race.

Both specimens were obtained in the bare, dry rice-fields south of Sathorn Road. In the case of the first one, my collector reports that he had just shot a Red-throated Pipit (*Anthus cervinus*), on the ground, when the hawk suddenly swooped on it from the air, and carried it off to a tree to devour. The man followed the hawk to the tree and shot it there.

*42. *Falco peregrinus calidus* Lath. *The Eastern Peregrine Falcon*.

1♀ subad. Bangkok, Central Siam, December 1917.

Iris dark brown. Bill bluish grey at base, passing into blackish at tip. Cere, eyelids and skin round eyes greenish grey. Legs yellow. Claws black.

T.L. 457 mm. W. 325.

Family COLUMBIDÆ—*Pigeons and Doves*.

43. *Columba livia intermedia* Strickl. *The Indian Blue Rock-Pigeon*.

Columba intermedia, Faun. Brit. Ind., Birds, iv (1898), p. 29:

Barton (Journ. Nat. Hist. Soc. Siam, i, p. 108), in his "Short List of Birds from the Raheng District," observes:—"Kept by priests in Raheng Wats (Temples), I have not seen them wild, but they must be found in suitable places."

H. R. H. the Prince of Chumporn has sent me a specimen shot by him in May 1915 at Muang Singh, in Central Siam (W. 212. mm.), and another (♂), procured at Chainat, also in Central Siam (W. 210), in February 1917. Subsequently, my collector shot one at Tachin, in January 1918, and two in the immediate vicinity of Bangkok, in May and July 1918, of which last three the measurements are as follows:—

1 ♂. T. L. 320 mm. W. 215.

2 ♀. T. L. 330,— mm. W. 215, 220.

Iris brownish orange. Bill black, whitish at base of upper mandible. Legs lake-red. Claws dark horn.

According to Blanford (*loc. cit. supra*; this subspecies of the Blue Rock-Pigeon of Europe has a wing measuring 9 inches (228.6 mm.), whereas the wings of the five specimens above mentioned range from 210 to 220 mm., with an average of about 214.4 mm., or under $8\frac{1}{2}$ inches. This fact made me somewhat doubtful whether the birds were genuine wild specimens, or semi-domesticated individuals. I have, however, submitted them to Mr. H. C. Robinson for examination, and he writes:—"I see no reason why your birds should not be considered as this form, which has been recorded from 'Siam' by Schomburgk, and from Salanga † by Darling." Personally, I am still doubtful of the five specimens here recorded, and I include them in this list with all reserve.

44. *Alsocomus puniceus* Tickell. *The Purple Wood-Pigeon.*

Alsocomus puniceus, Gairdner, Journ. Nat. Hist. Soc. Siam, i, pp. 39 and 151; Gyldenstolpe, 1916, p. 151; Kloss, Ibis, 1918, p. 83.

2♂. Koh Phra, Inner Gulf of Siam, March 1918.

T. L. 385, 380 mm. W. 223, 216.

The authors above quoted obtained their specimens in the Western and South-western divisions of the country, whereas mine were procured on a small island off the coast on the eastern side of the Inner Gulf of Siam.

*45. *Macropygia ruficeps* (Temm.). *The Little Malay Cuckoo-Dove.*

Mr. K. G. Gairdner obtained a specimen of this small long-tailed dove near Raheng, in the northern part of Central Siam, at a height of 1500 ft. in May 1917.

(Length 13'4". Tail 6'5". Iris brown. Tarsus red. Bill fleshy, K. G. G.)

† Salanga, of the old authors, is the Siamese island of Puket, off the west coast of the Malay Peninsula. To the inhabitants of British Malaya it is now known as Tongkah.

My collector subsequently procured two, in September 1917, in the district of Muang Wang, Northern Siam.

2♂ imm. T. L. 295, 252 mm. W. 148, 137.

Family *PHASIANIDÆ*—*Pheasants, Partridges, etc.*,

46. *Arboricola brunneipectus* Tick. *The Brown-breasted Hill-Partridge.*

Arboricola brunneipectus, Gyldenstolpe, 1916, p. 156.

Gyldenstolpe's specimen was obtained at Doi Vieng Par, a mountain in North-western Siam, but it was, he states, too badly damaged to be preserved and could only be used for identification. He adds, "The Brown-breasted Hill-Partridge is only to be found among the mountains of Northern Siam."

In view of this statement it may be noted that Mr. K. G. Gairdner procured a specimen (identified by the British Museum) at Sai Yoke, Western Siam, in March 1915, at an elevation of 800 metres.

Family *HELIORNITHIDÆ*—*Finfeet.*

47. *Heliopais personata* (Gray). *The Masked Finfoot.*

1♂. Muang Khlung, Chantaboon, South-eastern Siam, May 1917. W. 268 mm.

This specimen was procured by my collector, who, unfortunately, was incapable of noting the colours of the soft parts. Muang Khlung, the locality where it was obtained, is a coastal district about 12 miles south-east of the town of Chantaburi.

Bonhote's example from Jalor, Patani, in 1899 (P. Z. S., 1901, p. 79), and that of Robinson from Koh Pennan, an island in the Bight of Bandon, in 1913 (Journ. Fed. Mal. States Mus., v, No. 3 (1915), p. 141) appear to be the only previous records of this rare bird from Siam. Both these localities are in Peninsular Siam, on the opposite side of the Gulf to that on which my specimen was obtained.

Family *RALLIDÆ*—*Rails, Crakes, etc.*

48. *Porzana pusilla* (Pall.). *The Eastern Crake.*

Bonhote (P. Z. S., 1901, p. 79) records a specimen obtained by the Skeat Expedition at Patelung, Peninsular Siam, in April 1899.

No further examples appear to have been procured in this country until January 1917, when Major-General E. W. Trotter, of the Gendarmerie, while on tour at Minburi, about 15 miles east-north-east of Bangkok, had ten of these birds brought to him alive, which had just been caught in nets among high grass. He kindly gave me four for my collection, and put the rest into his aviary.

Subsequently, I obtained four more in October 1917 from the immediate outskirts of Bangkok, of which one was shot by Major C. H. Forty, of the Gendarmerie, at the Sports Club, two by Mr. J. J. McBeth at the "Ditches," east of the Wireless Station, and the fourth by my collector at the last mentioned place. They were all shot out of longish grass.

3♂ ad., 2♂ imm., 2♀ ad.

Males (adult). W. 87, 90, 91 mm. Females. W. 88, 90 mm.

Iris bright brick-red. Bill dull green, darker on culmen.

Legs olive-green. Claws horn-colour.

Family *OEDICNEMIDÆ*—*Stone-Plovers*.

*49. *Oedienemus scolopax* (S. G. Gmel.). *The Stone-Plover*.

H. R. H. the Prince of Chumpon obtained a specimen (W. 215 mm.) at Sena Yai, Krung Kao, Central Siam, in February 1916, while I procured another in the fields between Klong Toi, Bangkok, and the Chao Phya river, in July 1918. The particulars of the latter are as follows:—

1♀. T.L. 385 mm. W. 223.

Iris brownish yellow. Terminal half of bill blackish; basal half yellow above, greenish yellow below, with culmen and commissure blackish. Eyelids yellow. Legs pale greenish yellow. Claws black.

Family *CHARADRIIDÆ*—*Plovers, Sandpipers, etc.*

*50. *Microsarcops cinereus* (Blyth). *The Grey-headed Lapwing*.

Mr. K. G. Gairdner obtained a specimen at Raheng, in the northern part of Central Siam, in January 1916.

(Not uncommon, and usually found singly, or in pairs or threes, in company with *Hoplopterus ventralis*, the Spur-winged Plover. K. G. G.)

H. R. H. the Prince of Chumpon subsequently procured another at Pak-hai, Krung Kao, Central Siam, in March 1917, while I obtained a third specimen (solitary) at Bangkok, in October 1917, of which the following are the particulars:—

1♂ imm. T. L. 362 mm. W. 242.

Iris reddish brown. Terminal third of bill black, remainder yellow. Lappets and edges of eyelids yellow. Legs greenish yellow. Claws black.

51. *Squatarola helvetica* (Linn.). *The Grey Plover*.
Squatarola squatarola, Gyldenstolpe, 1916, p. 143.

Gyldenstolpe records this species from Siam on the strength of having seen a specimen resting on the sandy beach just outside the village of Koh Lak, in South-western Siam.

My collector obtained one (♀) at Paknam Chantabun, South-eastern Siam, in March 1916. W. 200 mm.

52. *Limosa limosa* (Linn.). *The Black-tailed Godwit*.
Limosa belyica, Faun. Brit. India, Birds, iv (1898), p. 254.
Limosa melanuroides, Journ. Nat. Hist. Soc. Siam, ii, p. 62.

I have previously recorded in this Journal (*loc. cit.*) that a specimen of this bird was obtained by Mr. C. J. Aagaard on Koh Khwai, Inner Gulf of Siam, in November 1911. Last year I obtained two from the fields round Bangkok—the first of which was shot by Major C. H. Forty, early in September, out of a flock of about 15 feeding on fairly wet, newly ploughed rice-land. The second was brought to me alive in November by a Siamese who had caught it the previous night by means of a small hand-net. The *modus operandi* is to sally forth on a dark night, with a torch carried by a second person, and to drop the net on to any bird seen on the ground. The birds, it appears, are fascinated by the light, and frequently make no attempt to get away. I have had many small waders (including snipe), as well as pipits, &c., brought to me by these men.

2♂. T. L. 394,— mm. W. 198, 182.

Iris dark brown. Terminal half of bill dark brown, basal half dull pinkish flesh. Legs dark brown. Claws dark brown.

In the second (and smaller) bird, the terminal half of the bill was blackish, the basal half dusky purplish (lighter on the lower mandible), and the claws blackish.

53. *Terekia cinerea* (Güldenst.). *The Avocet Sand-piper.*

Ogilvie-Grant (Fasc. Malay., Zool. iii (1905), p. 118), records a specimen from Kampong Budi, Patani, Peninsular Siam, in October 1901. The species is also included by Robinson and Kloss in their paper (Ibis, 1911, p. 13) on birds obtained in Trang, on the Langkawi Islands, etc., but without specifying any particular locality. They merely observe that it is common along the coast in the winter months. The fact is, therefore, worth noting that H. R. H. the Prince of Chumpon shot a specimen (♂, W. 130 mm.) on the mud-flats at the mouth of the Chao Phya river, at the head of the Gulf of Siam, in April 1917.

*54. *Totanus fuscus* (Linn.). *The Spotted Redshank.*

H. R. H. the Prince of Chumpon obtained a specimen of this bird (♂, W. 165 mm.) near Chainat, Central Siam, in February 1917, and a second one (unsexed, W. 163 mm.) at the mouth of the Chao Phya river, in April 1917. I cannot trace any previous records from this country.

*55. *Tringa crassirostris* (Temm.). *The Eastern Knot.*

In February 1918 I found this bird common at Lat Yai, near Meklong, Central Siam. In this locality there is an extensive area of bare, semi-swampy ground, with a hard, rather sandy surface, and in one place the water forms a kind of shallow lagoon, a few inches deep, shelving very gradually from the margin to the centre. The place is within a very few miles of the sea, and not far off are the fields where salt is collected by the evaporation of sea-water. It was there that a considerable number of *Tringa crassirostris* were found, standing in the shallow water, and prepared, on one's too near approach, to rise in a flock and wheel off to a distant part of the miniature lake. Stalking about in the deeper portions were a number of *Himantopus candidus* (the Black-winged Stilt), with the usual sandpipers on the margin of the piece of water.

3 ♂. T. L. 293, 293, 295 mm. W. 192, 182, 188.

3 ♀. T. L. 290, 295, 295 mm. W. 190, 185, 189.

Iris dark brown. Bill blackish brown. Legs dusky greenish.

Claws blackish.

56. *Tringa platyrhyncha* (Temm.). *The Broad-billed Stint.*

A specimen was shot by H. R. H. the Prince of Chumpon in April 1917, at the mouth of the Chao Phya river. The only previous record I can trace is that of Ogilvie-Grant (Fasc. Malay., Zool. iii (1905), p. 118), who reports an individual of this species obtained at Kampong Budi, Patani, Peninsular Siam, in September 1901.

Family LARIDÆ—*Gulls and Terns.*

57. *Larus brunneicephalus* Jerdon. *The Brown-headed Gull.*

Larus brunneicephalus, Gyldenstolpe, 1913, p. 70.

5♂, 5♀. Estuary, Tachin river, December 1916 and March 1917

Males. W. 336—354 mm. (average 343).

Females. W. 334—345 mm. (average 333).

2♀. Bangkok, Central Siam, April 1918.

T.L. 451, 445 mm. W. 325, 330.

Iris dull white to dull yellowish white. Mouth orange-red. Eyelids and bill deep lake-red. Legs dull red to lake-red. Claws dark horn-colour.

Gyldenstolpe includes this species in his list of Siamese birds, but as no particulars of specimens are given, it is to be presumed he did not procure any. He states that it is common along the northern coast of the Gulf of Siam, and that it also occurs a few miles up the Chao Phya river, but never as far up as Bangkok. The last part of this statement is incorrect. I shot the above two Bangkok specimens opposite the Bombay Burma Trading Corporation's sawmill, and I have seen others at different times, higher up the river, including a party of 8 or 10 flying up-stream past the Custom House. The fact is, this bird is quite common on the river during the winter months, right up as far as Bangkok, though it is only to be seen during certain phases of the tide—coming up with the flood and going down with the ebb.

*58. **Hydrochelidon leucoptera** (Meisner and Schinz).*The White-winged Black Tern.*

I have three specimens of a small tern, shot in the neighbourhood of Bangkok, which I have identified as belonging to this species. One, obtained in February 1915, is in winter plumage, while the other two, which were procured in April and October 1918, appear to be immature individuals, so the only means of distinguishing them from *H. hybrida* (the Whiskered Tern), which is the common species in this locality, is by size. By this test the identification seems correct, and I can see no difference between my birds and a specimen of *H. leucoptera*, from Penang, which has been kindly sent to me by Mr. H. C. Robinson for comparison.

1♀. W. 214 mm. Bill from gape 35.

2♀ imm. W. 200, 206 mm. Bill from gape 32, 34.

Iris dark brown. Bill blackish brown, slightly tinged with red. Gape pale reddish. Mouth reddish flesh. Legs orange-red, dusky in front. Claws dark horn.

*59. **Hydroprogne caspia** (Pall.). *The Caspian Tern.*

I obtained three fine specimens of this large and handsome tern at Tachin, Central Siam, in March 1917. They were all shot flying over the river, and, as observed by Blanford (Faun. Brit. India, Birds, iv (1898), p. 310), this species may be readily distinguished (apart from its great size) by its habit, when looking for food, of flying over the water with the bill directed downwards, almost at right angles to the line of the body. It is usually found singly, but sometimes a couple may be observed together.

2♂. W. 408, 405 mm.

1♀. W. 400 mm.

Iris dark brown. Bill sealing-wax red, dusky at tip. Mouth sealing-wax red. Legs and claws black.

60. **Sterna sinensis** Gmel. *The White-shafted Ternlet.*

1♂, 1♀. Koh Lak, South-western Siam, June 1917.

2♂. Hua Hin, South-western Siam, June 1918.

Males. T.L. 236, 240, 280 mm. W. 181, 180, 187.

Female. T.L. 243 mm. W. 186.

Iris dark brown. Bill yellow, tipped black. Legs deep yellow. Claws horn-colour.

The only previous records appear to be those of Bonhote (P.Z.S., 1901, p. 80) and of Ogilvie-Grant (Fasc. Malay., Zool. iii (1905), p. 119), from Patani, Peninsular Siam, in 1899 and 1901, respectively.

***61. *Anous stolidus* (Linn.). *The Noddy*.**

3♂, 1♀. Rocky islet near Koh Chuan, Inner Gulf of Siam, May 1918.

Males. T.L. 427, 432, 437 mm. W. 282, 280, 300.

Female. T.L. 407 mm. W. 276.

Iris very dark brown. Mouth and gape yellow. Bill black. Legs blackish brown. Claws black.

The islet where these birds were obtained is a few miles south of Koh Chuan, in the Inner Gulf of Siam, and is an absolutely bare, low-lying rock, without the slightest sign of vegetation of any kind. It was absolutely swarming with terns (*Sterna bergii*, *S. melanauchen* and *S. anaetheta*), all breeding, and among these the dark smoky or chocolate-brown Noddies were very conspicuous. They were also most extraordinarily tame, and I could have shot any number, but was content with four. The specific name is a very apt one, as the bird gives one the impression of being rather stolid and dull-witted.

I was so fortunate, also, as to obtain two eggs of this species—each laid singly on a slight depression on the bare rock.

Family *SULIDÆ*—*Gannets*.

62. *Sula sula* (Linn.). *The Booby or Brown Gannet*.

1♂. Rocky islet near Koh Chuan, Inner Gulf of Siam, May 1918.

T.L. 775 mm. W 400.

Iris white. Bill pale bluish horn-colour. Pouch bluish slate. Loose skin at base of mandible yellowish green. Legs pale greenish yellow. Claws pale bluish horn.

I have already recorded (Journ. Nat. Hist. Soc. Siam, ii, p. 63) the finding of a sun-dried specimen of this bird on an islet near Koh Rin, in the Inner Gulf of Siam, in July 1916. On the present occasion

I came across four or five Brown Gannets, on the same rocky islet as that on which the Noddies were procured, and shot a couple. One, however, drifted away on a strong tide, and was lost to view before the boat from which I had landed (which was at the other end of the islet), could be brought round. The specimen I obtained was a fine adult bird, in full plumage.

Family *PHALACROCORACIDÆ*—*Cormorants*.

*63. *Phalacrocorax fuscicollis* Steph. *The Indian Shag*.

2♂, 3♀ ad., 3♂, 1♀ imm. Klong Pho Thao, off Klong Samrong, 24 miles south-east of Bangkok, Central Siam, (?) August and September 1916.

Males (ad.). W. 260, 262 mm.

Females (ad.). W. 255, 266, 267 mm.

These birds were procured by my collector, who reported them as very common. The locality in which they were obtained is that described in connection with *Aquila maculata*, the Large Spotted Eagle (*antea*, p. 27). The two adult males and one of the adult females have the pure white tuft of feathers on each side of the neck, behind the ear-coverts, which is assumed in the breeding season. The months in which they were procured, as mentioned above, are approximate only. I was away from Siam from August to December 1916, and the collector, who is illiterate, informed me that he had shot the birds during the first two months or so of my absence.

I have never come across this bird myself. When I visited the above locality, in May 1918, I only saw specimens of *P. javanicus*, the Little Cormorant.

Family *CICONIDÆ*—*Storks*.

64. *Anastomus oscitans* (Bodd.). *The Open-bill*.

I came across a large number of these birds feeding in the semi-swampy, grassy fields at a place called Prom-den, on the railway between Bangkok and Tachin, in March 1917. They were rather wild, but I succeeded in obtaining a couple. As a result of the firing, the birds (which were scattered over a wide area, in small parties) collected together in a large flock of 60 to 80 individuals, and wheeled about with outstretched wings, high in the air, looking very much like vultures.

1♂, 1♀. Prom-den, Meklong Railway, Central Siam, March 1917.

Male. W. 416 mm. Female. W. 411.

Iris dull yellowish white. Bill dull greenish horn, blackish at base, and reddish at tip and on underside of lower mandible. Gular skin and bare skin in front of eyes blackish. Legs fleshy white. Claws dull pinkish, dark at tips.

My collector subsequently obtained four immature specimens at Ta-rdia, Central Siam, in July 1917.

The only previous reference to this bird, which I have come across in the literature dealing with the ornithology of Siam, is that of Gairdner (Journ. Nat. Hist. Soc. Siam, i, p. 30) who states that the huge flocks of it, which occur there, are a feature of the broad plains north-west of Ratburi.

The Siamese name, *Pak-hang*, corresponds very closely in its meaning to the English one.

Family ARDEIDÆ—Heron.

65. *Herodias garzetta* (Linn.). *The Little Egret.*

Garzetta garzetta, Ogilvie-Grant, Fasc. Malay., Zool. iii (1905), p. 117.

1♂, 4♀. Tachin, Central Siam, August 1917 and January 1918

3♂, 2♀. Bangkok, Central Siam, November 1917.

Male (one). T. L. 603 mm. W. 274. Males (three). W. 276, 278, 280 mm.

Female (one). T. L. 552 mm. W. 252. Females (five). W. 258, 260, 261, 269, 275 mm.

Iris pale yellow. Bill blackish, base of lower mandible whitish flesh. Facial skin greenish yellow. Tarsus and bare portion of tibia very dark to blackish brown. Toes yellowish green to greenish yellow. Claws horn colour.

The difference in colour between the tarsus and the toes is sharply defined and is a striking peculiarity of this bird. In some specimens the green of the toes extends up the tarsus as much as 25 to 40 mm.

The specimen listed by Ogilvie-Grant (*loc. cit. supra*) was obtained at Jering, Patani, Peninsular Siam, in June 1901. There appear to have been no published records from this country, subsequent to that date, though Mr. C. J. Aagaard's diary contains a note of two shot at Anghin and Bang Phra, both being places on the eastern coast of the Inner Gulf of Siam, in December 1912 and February 1913, respectively, while H. R. H. the Prince of Chumpon obtained a fine specimen in breeding plumage, also at Bang Phra, in May 1917.

The bird is probably quite common in suitable localities, and has merely failed to be recorded, of late years, owing to its close resemblance to the ubiquitous *Bubulcus coromandus* (the Cattle Egret), when the latter is in its white or non-breeding plumage. The most noticeable difference between the two species is in the colouration of the bill, which is black in the case of *Herodias garzetta*, and yellow in that of *Bubulcus coromandus*.

I had never seen the bird in Bangkok until last year, when it was very common during the floods in November, but disappeared as soon as they subsided.

66. *Gorsachius melanolophus* (Raffles). *The Malay Bittern*.

So far as I can ascertain, this species has hitherto been recorded only from Trang, Peninsular Siam (Robinson and Kloss, Ibis, 1911, p. 15), and Koh Lak, South-western Siam (Gyldenstolpe, 1916, p. 137). It is worth noting, therefore, that Mr. K. G. Gairdner obtained a specimen (identified by the British Museum) at Sai Yoke, Western Siam, in April 1915.

(♂. Iris yellow. Orbital skin greenish grey. Legs yellowish green. K. G. G.).

My collector subsequently procured two, in Northern and Eastern Siam, respectively, of which the following are the particulars:—

1♀. Phrae, Northern Siam, May 1916. W. 256 mm.

1♂ imm. Lat Bua Khao, Eastern Siam, September 1916. W. 256 mm.

Family *ANATIDÆ*—*Swans, Geese and Ducks.*67. *Sarcidiornis melanonotus* (Penn.). *The Comb Duck.**Sarcidiornis melanolota* (sic.), Gyl lenstolpe, 1916, p. 134.

1♂. Klong Luang Peng, near Bangkok, Central Siam, February 1918.

T. L. 711 mm. W. 370.

Iris dark brown. Bill and comb black. Legs dull greenish plumbeous. Nails dark horn.

Shot by Mr. R. B. H. Gibbins, who kindly gave it to me for my collection.

The only previous reference to this fine bird, which I can trace, is that of Gyldenstolpe who saw some specimens in captivity in the garden of the Lao Prince of Chiengmai, Northern Siam. These were said to have been caught somewhere in Upper Siam.

Family *PODICIPEDIDÆ*—*Grebes.*68. *Podiceps alpinus* (Sharpe). *The Indian Little Grebe.**Podiceps philippensis*, Bonhote, P. Z. S., 1901, p. 80.

1♂, 1♀. Prom-den, Meklong Railway, Central Siam, March 1917.

1♀. Muang Khlung, Chantaburi, South-eastern Siam, May 1917.

Male. W. 104 mm. Females. W. 107, 103.

Iris yellow. Bill yellowish horn, blackish on culmen and at base of lower mandible. Legs dusky green, darker on toes and webs. Nails dull greenish, tips whitish.

The first two birds were obtained by me out of a party of about half-a-dozen which I came across on a small, shallow, grassy pool of water in the middle of the fields referred to in connection with *Anastomus oscitans*, the Open-bill (*antea*, p. 39). They were swimming on the surface, looking much like Cotton Teal, though smaller, and, when fired at, either dived, or disappeared into the long grass at the edge of the pool. I managed, however, to flush one, and obtained a second shot.The only previous record appears to be that of Bonhote (*loc. cit. supra*) who lists a specimen obtained by the Skeat Expedition at Patelung, Peninsular Siam, in March 1899.

MISCELLANEOUS NOTES.

I. Sore neck in Sambar (*Cervus unicolor*).

In Vol. I, pp. 51-53 of this Journal, Mr. P. R. Kemp, under the heading "Sore neck in Sambar," gave an account of the curious sore often found on the neck of Sambar in the mid-line in front, and about half way down. The Editors added a remark to the effect that "Major Evans in his book, *Big Game shooting in Upper Burma* (1910), speaks of it, and states positively that it occurs in all Sambar and at all times (presumably in Burma and India)." I have never found any mention of it by any other author treating of Sambar, which is curious in view of the fact that the sore is undoubtedly of very frequent occurrence.

In Mr. Kemp's note he mentions that both he and I had shot Sambar on which we had not noticed the sore. Major Evans says, however, "At what age the calves are attacked I do not know, but I have seen the spot distinctly on quite young calves not more than a month or two old. If any sportsman should be inclined to doubt my statement as to this blemish on a Sambar's throat, I can only say, let him examine carefully the next Sambar he shoots; and if he doesn't find a large bare circular scar on its throat, with a blood-red spot in the centre of it, I will eat my words served up with Sambar sauce! Can I say more?" Regarding this positive statement it may be of interest to record that, on the 11th February this year, on the west bank of the Meklong River, about Lat. N. 14° 26', Long. E. 99° 5', I shot a Sambar, about two years old, having no sign whatever of any sore on its neck. I particularly called the attention of a Siamese surveyor, who was with me, to this fact.

A. J. IRWIN.

March, 1918.

II. Note on the Wild Dog (*Cyon rutilans*).

On page 54, Vol. I, of the Journal of this Society, in a note headed "Distribution of certain animals in Siam," Mr. K. G. Gairdner writes, "Messrs. Yates and Rogers, of the Bombay Burma Trading Corporation, have reported a black species of Wild Dog. Has anyone else ever met with this animal, and have specimens ever been obtained?"

I do not know of any specimens of a black wild dog having been obtained, but on the 4th March this year a Siamese surveyor working in S. E. Siam (about Lat. N. 12° 52'; Long. E. 101° 7',) informed me that, a few days previously, while at work, two wild dogs

passed close by him chasing a Barking Deer, and that one of the dogs was black, and the other the usual red colour. He was positive they were wild dogs. His coolies saw them also. I mention his statement as evidence that black wild dogs occur, and can occasionally be seen. From a small amount of personal observation, and after making some inquiries from the inhabitants of jungle districts frequented by wild dogs, I should infer that a wild dog of that colour is very rare. I should suppose it to be a case of melanism in an individual of the species usually coloured red, and not an indication of the existence of a separate black species.

In the same note Mr. Gairdner inquires "Where do the (red) Wild Dogs (*Cyon rutilans*) go in the dry season? I have observed that they chase the Sambar down to the cultivation at the beginning of the rains in May and June; at other seasons I never see them."

Referring to this query, I would say that it seems to me these destructive brutes are only guided in their wanderings over the districts they inhabit by the occurrence of the animals they prey on. If they can find Sambar, or other quarry, in the lowlands or near cultivation in the dry season, they may be found there at that time of year. I myself have seen them on low ground not far from cultivation or villages on three occasions during the dry season. On one of these a wild dog was shot by Mr. N. E. Lowe, on another occasion one was shot by me, and on a third I drove some wild dogs off the carcass of one of the cattle belonging to a neighbouring village, which they had just killed.

June, 1918.

A. J. IRWIN.

III. Occurrence of the Pegu Sparrow (*Passer flarcolus*) in South-western Siam.

In a previous issue of this Journal (Vol. II, No. 3, p. 197), I remarked that the only portions of Siam from which the Pegu Sparrow had not been reported were the Western and Peninsular* divisions, and that these might be outside its range, as I had been unable to find any records of its occurrence in Tenasserim or the Malay Peninsula.

Since I wrote the above, my collector has brought me specimens from Hua Hin and Pran, in South-western Siam—the latter place (the more southern of the two) being in about latitude 12° 25' N. These were obtained in June last year. Subsequently, in the latter half of December 1917 and the beginning of January 1918, I found this bird quite common at Nong Kae, about 2½ miles south of Hua Hin, and obtained a couple of fine males in perfect plumage.

Bangkok,

W. J. F. WILLIAMSON.

March, 1918.

*The northern portion of the Peninsular division, as then referred to, is now generally designated South-western Siam, and extends as far south as the Isthmus of Kra, Lat. 10° 50' N.

IV. Occurrence of the Hair-crested Drongo (*Chibia hottentotta*) near Bangkok.

In his second Paper on the birds of Siam, Gyldenstolpe states (Kungl. Sv. Vet. Akad. Handl., Band 56, No. 2, p. 20, 1916) that he "obtained a specimen on the Korat plateau (in Eastern Siam), which "seems to be about its southern limit in Siam.....Further east "it seems to extend more to the south, as Dr. Tiraut records it from "Cochin-China."

In view of this remark it is worth noting that my collector obtained a specimen at Meklong, about 40 miles E. S. E. of Bangkok, in February 1918. In the same month, and in the following one, I found the bird fairly common in the narrow belt of trees, composed largely of fruit-gardens, extending along the river-bank immediately to the south of Sathorn road in Bangkok (Lat. 12° 40' N.) and distant from there about 2 or 3 miles. I obtained altogether four specimens from that neighbourhood, and I imagine the bird must breed there, as March is its nesting time. So far, however, I have failed to obtain its eggs.

W. J. F. WILLIAMSON.

Bangkok,
April, 1918.

V. A New Snake and a New Batrachian for Siam.

To the list of snakes to be found in Siam may now be added *Pseudoxenodon macrops*.

A fine male specimen of this snake was caught by Mr. C. M. Weston in Muang Wang, north of Lakon Lampang, at an altitude of about 1,000 feet. It tapes 40 inches with a tail of $7\frac{1}{4}$, rather longer than Mr. Boulenger's measurements in the Fauna of British India.

It also differs slightly in colour from his description, being a rich reddish-brown above with a yellowish white chevron-shaped mark on the back of the neck, and with black edges posteriorly to 2nd to 6th upper labials. The orange dorsal spots have faded in spirit to a dirty white. Ventrals 162; sub-caudals 65.

Mr. C. A. Sheriff of the B. B. T. C. L., has recently sent me a specimen of *Megalophrys carinense* which he obtained in the Me Taw, a tributary of the Me Wang, some miles west of Lakon Lampang, at an altitude of 700/800 ft. This batrachian has not previously been recorded from Siam. It differs from Mr. Boulenger's description in the Fauna of British India in having two strong groups of vomerine teeth between the choanae. Length from snout to vent 110 mm.

P. A. R. BARRON.

July, 1918.

VI. The Siamese names of some Snakes.

Having read articles on the subject of Snakes in this Journal, the following may be of interest to your readers.

To the people of Mondhol Payap the Malayan Viper (*Ancistrodon rhodostoma*) is not an unfamiliar snake and is generally known as "ngu tūng chāng (งูตึงช้าง)" or "ngu tūng kabā (งูตึงกะบ่า)," the former name being applied to the bigger-sized ones. In Rajburi, Petchaburi, and Prachuab Kirikhan districts the Siamese call it "ngu kapa (งูกะป)" or more descriptively correct, "ngu kapa fālamī (งูกะปฝาฝ)"^๔. "Fālamī" is the vernacular name for the lid of the ordinary Siamese earthen cooking-pot, the shape of which the snake sometimes simulates when it has coiled itself up into a broad conical mass, with its head projecting out on the top. If what I am told is correct, this viper is known round Bandon as "ngu pāk book (งูปากบุค)"^๕. There

are other names beginning with "ngu kapa" but these, it appears, are given to *Ancistrodon rhodostoma* of different sizes and shades or colours.

So far as I have been able to observe, the species occurs as far north as Latitude 19° 20', and as high up as 1500 feet elevation. Judging from the different places the snake has been known from, the range of distribution of *Ancistrodon rhodostoma* in Siam may, I think, practically be said to cover the whole of the country.

This snake is partial to dry localities, such as those with sandy or laterite soil. It is often to be met with on the sandy coast of the Peninsula. Further inland and further north it may generally be looked for in places where grow "mai tūng" or "mai pluang" (*Dipterocarpus tuberculatus*) and "mai teng" and "mai rang" (*Shorea* sp.), which form tree-growths generally characteristic of localities having laterite soil. The Payap name of the snake, "ngu tūng" derives its origin from "mai tūng," in which forest it is generally found.

The bite from *Ancistrodon rhodostoma* is said by some of the people to be deadly, but by the majority it is considered to have an effect more or less equal to that of the common Green Pit-Viper (*Lachesis gramineus*) which rarely, if ever, proves fatal to man.

The other snakes of Chiangmai and neighbourhood that go by the local generic name of "ngu tūng" are the common and widely spread *Simotes cycularis*, "ngu tūng hua kieng, (งูตึงหัวเกียง)"^๖

and a somewhat rare *Simotes* species known on account of its uniform red colour as “ngu tung fai (งูตึงไฟ).”

Of names for the Hamadryad (*Naja bungarus*) there are several, the common black variety, with or without whitish or yellowish cross-bars on the body, being known to the central and southern Siamese as “ngu hao dong, (งูเห่าดง)” and to the Payap people as “ngu hao hawm (งูเห่าห่ม),” and the olive-brown or pale variety being generally known as “ngu chong arng, (งูจงอาง).” In the same way the black variety of the Cobra (*Naja tripudians*) is known to the Siamese as “ngu hao maw, (งูเห่าหม้อ),” and to the Payap people as “ngu hao pak, (งูเห่าปาก),” and the lighter coloured form as “ngu hao pluak” or “phüerk (งูเห่าปลวก or ผีอก).”

There is a certain kind of big poisonous snake in the Chiengmai district known to the people as “ngu hao kaw kam (งูเห่าคอคำ).” It is said to be a hill denizen, but occasionally comes down to the neighbouring plains. It grows to the size of a man’s thigh, and has a uniform black colour, with a patch of golden-yellow on the throat, hence the name. It is notoriously aggressive in disposition, and its bite is fatal to man.

From this description of the snake one might consider it a variety of the Hamadryad with the ordinary whitish or pale-yellowish throat. But since the natives claim it to be distinct from the Hamadryad, and I have not seen the snake myself, I shall be interested if any of your readers can tell me what the “ngu hao kaw kam” of the North really is.

LUANG WINIT WANADORN.

August, 1918.

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ON A FOURTH COLLECTION OF SIAMESE MAMMALS.

By C. BODEN KLOSS, F.Z.S.

The present contribution deals with parts of the collections obtained in Western Siam by Mr. K. G. Gairdner, and in North Siam by Messrs. Williamson and Smith's collectors; and my thanks are also due to Dr. Malcolm Smith, Messrs. W. L. Williams, H. C. St. J. Yates, A. J. Irwin, W. J. F. Williamson and J. J. McBeth for sending various specimens for examination.

As to some of the more obscure localities mentioned:—Sikawtur and Me Taw are in Western Siam, 40-50 miles N.W. of Raheng, and cut off from the main Me Ping river valley by a big mass of hills from 3,000 ft. to 4,000 ft. in height.

All the following are N.N.E. of Nakon Lampang, North Siam:—

Me Puan. A right bank tributary of the Me Wang: the collection was made in evergreen jungle between 1,500-2,000 ft.

Pa Meang, Me Nga. One side of this hill drains into the Me Kong: Pa Meang is a tea-garden at about 2,000 ft.

Ban Phong Tham and Ban Me Yen are in the Me Wang forest at no great height.

1. *Macaca irus* CUVIER.

1 ♀ juv. from Paknampo, Central Siam [No. 2689/CBK.].
Collected by Mr. K. G. Gairdner. Orig. No. 487.

Head-skin and skull only, but evidently a very dull-coloured young animal. A few black hairs on the forehead. A small tuft on the crown.

2. *Macaca assamensis*.

Macacus assamensis, McClelland, P. Z. S. 1839, p. 148; Anderson. Anat. and Zool. Res., p. 64 (1878); Blanford, Fauna Brit. Ind., Mamm., p. 15 (1881).

1 ♀ subad. from Me Puan, N.N.E. of Lakon Lampang, North Siam, 1,500-2,000 ft. Messrs. Williamson and Smith's collectors. September 1917. [No. 2671/CBK.].

This animal just falls short of being adult, in that the last molars, though well up and with the anterior cusps worn by contact with the teeth in front of them, do not yet engage with each other.

The species was very shortly described by McClelland and the type is now lost, but before it disappeared it was examined by Anderson who fortunately published a good account of it.

I think this specimen is undoubtedly an example of *M. assamensis* but am unable to say whether it is truly typical. One feature shown is curious; the tail, which does not appear to be either mutilated or malformed, is not only merely an inch and three-quarters long, but is only a quarter of an inch in diameter; it is thickly clothed with hair and thus in no way resembles the naked stump-tails of *arctoides* and *rufescens*. In being thus well clad it resembles that of *assamensis*, but the typical animal has the tail about half the length of head and body and about an inch in diameter.

There is no whorl or ridge of hair on the top of the head; the hair, quite short in front and longer on the nape, grows quite smoothly backwards and sideways from the forehead. Pelage slightly wavy.

The upper parts of the body are light mummy brown, very indistinctly annulated with golden ochraceous, the latter colour increasing in amount on the shoulders; sides and limbs paler, arms suffused externally with golden ochraceous like the shoulders, the legs tinged with drab: crown and nape a little paler than the back: sides of neck and under-parts thinly clad with pale greyish buffy fur lightest on throat and chest. Tail paler than the rump and golden buff above; hands and feet like the limbs. Face thinly clad with short pale hairs. Buttocks covered to the edges of the callosities.

Native collector's external measurements:—head and body, 465; tail, 44; hind foot, 131. Skull:—greatest length, 118.5; condylo-basal length, 85; basal length, 76; palatal length, 44; upper molar row

(alveoli), 33.5; m_2 — m_2 (alveoli), 21; breadth of rostrum across canines (alveoli), 28; occipito-nasal length, 98; breadth of braincase, 58; external biorbital breadth, 61; zygomatic breadth, 71; mastoid breadth, 59; orbits, 22×23 ; greatest length of mandible, 80; length of lower molar series (alveoli), 40; height of coronal process, 33; horizontal breadth of ramus through condyle, 27.

The skull resembles that of a female from near Bhamo figured by Anderson in the "Researches" (fig. 7, p. 66) as *M. assamensis*, but later referred by him to *M. leoninus** (= *andamanensis*).

It is to be hoped that residents in North Siam will succeed in obtaining further examples of this animal to prove whether the tail of the present specimen is natural or not; males are particularly desired. This species may be distinguished from *M. siamica* by its more uniform brown colour; the latter (more specimens of which are also wanted) having dark grey shoulders contrasting with a bright ochraceous rump.

3. *Nycticebus coucang cinereus* M-EDW.

Nycticebus cinereus, Kloss, Journ. N. H. S. Siam, II, pp. 77, 289 (1916-7).

A juvenile example from Wang Pong, S. W. Siam [No. 2672/CBK.]. Collected by Dr. Malcolm Smith.

This young animal has the face, nape, forelimbs and hind feet almost white and the hind legs very much frosted; there are isolated dark rings round the eyes and a dark stripe commences at the occiput and continues to the beginning of the rump; the back and sides are snuff brown, slightly frosted on the sides, strongly along the dark line and on the rump; the hair of the under-surface is brownish white.

Like all young animals of this species the fur is much longer and denser than in the adult.

Head and body, 190; tail, 10; hindfoot, 56; ear, 12 mm.

4. *Felis bengalensis*.

Felis bengalensis, Kerr, Animal Kingdom, p. 151 (1792); Flower, P.Z.S., 1900, p. 325; Gyldenstolpe, Arkiv för Zoologi, 8, No. 23, p. 25 (1914).

1 ♂ ad. skin and skull from Chiengmai, N. Siam [No. 2673/CBK.]. Collected by Mr. W. L. Williams.

* Cat. Mamm. Indian Mus., 1, p. 72.

Flat skin from north of Chiengmai [No. 2674/CBK.]. Collected by Mr. H. C. St. J. Yates.

The first specimen represents a dull coloured animal; ground colour of upper parts greyish buff; the markings are large and dark and are indistinctly bordered by ochraceous tawny patches. Very different is the brilliantly coloured skin sent by Mr. Yates, in which the ground colour of the upper surface is ochraceous buff much suffused with bright tawny mesially where there are broken black stripes; the other markings mostly take the form of triangular tawny patches with, generally, a blackish apex or border. This specimen apparently resembles Blanford's *pardichroa* Hodgs., from the Himalayas (Fauna Brit. Ind., Mamm., p. 80) which seems to have been based on a brightly coloured example of this variable cat.

Skull:—greatest length, 99; basal length, 82; greatest breadth, 67; upper sectorial, 9.8×3.6 ; lower molar row (alveoli), 18.5 mm.

5. *Viverra zibetha pruinosa*.

Wroughton, Journ. Bombay N. H. S., XXIV, p. 64 (1915); Kloss, Journ. N. H. S. Siam, II, p. 292 (1917).

Adult skin and skull from a little south of Sriracha, on the Inner Gulf of Siam [No. 2675/CBK.]. Collected by Mr. A. J. Irwin.

Mr. Wroughton distinctly states that there is in the ground colour of this race a total absence (which distinguishes it from other forms) of any yellow tinge; but the present specimen is decidedly suffused with buff on the lower parts of the flanks, thighs, head and sides of neck: to a less degree, an example from Patani, Peninsular Siam, is tinged with buff in the same way (Kloss, *l. c. s*). The type came from Thagata on the Little Tenasserim River, and the subspecies is said to extend north to the Shan States and south into the Malay Peninsula. This specimen comes from a locality so near the range indicated, that it would be unwise to separate it without more material and topotypes for comparison. It is not, as Mr. Wroughton states, in the tips of the hairs that the colour difference occurs, for they are blackish, but in the pale subterminal annulations.

Mr. Irwin's specimen is a fine adult with a broad, heavy skull and large teeth. Siamese name, *Sua præng* (maned tiger).

Measurements of the skull:—greatest length, 140; basal length,

128; zygomatic breadth, 72.5; breadth of braincase, 42; maxillary tooth-row exclusive of incisors (alveoli), 55; greatest length of upper sectorial, 16.6; interorbital breadth, 27; postorbital constriction, 21.3; breadth of basi-occipital, 17.5; mastoid breadth, 45.

6. *Arctictis binturong binturong* (RAFFLES).

Arctictis gairdneri, Thomas, Ann. and Mag. Nat. Hist. (8) XVII, p. 270 (1916).

Arctictis binturong binturong, Kloss, Journ. N. H. S. Siam, II, p. 293 (1917).

1 ♀ juv. from Sikawtur, N. W. of Raheng, W. Siam, 1,500 ft. 25 May 1917 [No. 2656/CBK.]. Collected by Mr. K. G. Gairdner. Orig. No. 444.

General colour above black with the base of the hairs dirty white, this colour much exposed on shoulders, sides and thighs; head and limbs grizzled with whitish; front of ears white; a few coarse buffy annulations on the rump; underparts of body dirty white, many hairs with black tips. Tail black, the hairs with dirty white bases much exposed below at the root. The longer whiskers yellowish.

Head and body, 658; tail, 695; hind foot, 125; ear, 48 mm. The skull is that of a young animal with milk dentition, the penultimate molars having just come into place. Length, 136; zygomatic breadth, 72 mm.

7. *Tupaia glis belangeri* (WAGN.)

Tupaia belangeri, Wroughton (partim), Journ. Bombay N. H. S., XXIII, p. 707 (1915) [Tenasserim village; Banlaw and Tagoot, 75 miles up the Tenasserim river]; Kloss, Journ. N. H. S. Siam, II, p. 9 (1916) [Patiyu, S.W. Siam]; Gyldenstolpe, Kongl. Sv. Vet. Akad. Handl., 57, No. 2, p. 18 (1917) [Koh Lak, S.W. Siam].

1 ♂ ad. from Pa Meang, Me Nga, N. N. E. of Lakon Lampang, N. Siam [No. 2669/CBK.]. Obtained by Messrs. Williamson and Smith's collectors. 24th Sept., 1917.

1 ♂ ad., 1 ♀ vix ad., 1 ♀ ad. from Sikawtur, N.W. of Raheng, W. Siam [Nos. 2657-9/CBK.]. Collected by Mr. K. G. Gairdner.

1 ♂ ad. from Hua Hin, Pran, S.W. Siam [No. 2453/CBK.]. Obtained by Messrs. Williamson and Smith's collectors. 21 June 1917.

1 ♀ vix ad. from Pran River mouth [No. 2544/CBK.]. Messrs. Williamson and Smith's collectors. 26 June, 1917. Mammæ 3-3=6.

All these specimens seem to me to belong to the same race, and I would call them *T. g. belangeri*: the animal from Me Nga is perhaps beginning to show some approach towards *T. luotum* Thomas (Ann. & Mag. Nat. Hist. (8) XIII, p. 224, 1914) from Nan, as there is a very slight darkening of the rump. Some of them, however, probably represent *T. siamensis* Gyldenstolpe (*op. cit. supra*, p. 20) from Koh Lak and *T. g. tenaster* Thomas (Journ. Bombay N. H. S., XXV, p. 201 (1917) from Tagoot to Tenasserim town.

(For measurements see table *postea*).

8. *Tupaia glis clarissa*.

Tupaia clarissa, Thomas, Journ. Bombay N. H. S., XXV, p. 200 (1917) [Victoria Point, S. Tenasserim].

Tupaia belangeri, Wroughton (partim) Journ. Bombay N. H. S., XXIII, p. 707 (1915) [Victoria Point and Bankachon].

1♂ subad., 1♂ ad. from Chumporn river mouth, S. W. Siam. [Nos. 2552,3/CBK.]. Obtained by Messrs. Williamson and Smith's collectors. July 1917.

The material is unsatisfactory but the long muzzle of the adult points to its being an example of *clarissa*.

The younger animal has the rump blackish and throughout the grizzling is rather fine. The adult is in very worn pelage, the saddle is black and there is a black patch on the rump: the fur (probably old) of the head and shoulders is ferruginous, much deeper in colour than the silky hair of the rump where the fur is very thin.

This Tree-shrew seems to me to link up those of the Malay Peninsula and some of the islands with those of Indo-China. The animals of the former region (*ferruginea* group) have backs markedly more rufous, longer snouts and, in females, two pairs of mammae only. Northern animals (*belangeri* group) have little or no rufous suffusion above, shorter snouts and three pairs of mammae.

The description of *clarissa* indicates that it is intermediate in colour between *belangeri* of Pegu and Tenasserim, and *wilkinsoni* of Trang, Peninsular Siam, being brighter and clearer than the first but less richly coloured than the latter; the muzzle, from tip to orbit, is as long as in *wilkinsoni* but the mammae are as in *belangeri*, i. e., 3 pairs; or when only four or five mammae are present, as happens, their spacing and position are as in the latter.

Tupaia clarissa was described as a full species but it appears to be merely an intermediate, but very interesting form completely connecting northern animals with southern ones and showing that all tupaia of this kind belong to races of one species, *T. glis* (Diard) of Penang, and not to several distinct species.

(For measurements see table *postea*).

9. *Hylomys suillus siamensis*.

Hylomys siamensis, Kloss, Journ. N. H. S. Siam, II, p. 10 (1916).

1 ♂ ad. Me Taw, N.W. of Raheng, W. Siam, 1,500 ft. [No. 2660/CBK.]. Collected by Mr. K. G. Gairdner on 2 Feb. 1917. Orig. No. 352.

1 ♂ ad. Sikawtur, N. W. of Raheng, 1,500 ft. [No. 2661/CBK.]. Collected by Mr. K. G. Gairdner on 15 March 1917. Orig. No. 409.

The second specimen of this rare insectivore exactly agrees in colour with the immature type; the first is rather brighter above, being more ochraceous on the rump. The tail is pale beneath.

Measurements:—Head and body, 138, 132; tail, —, 22; hind-foot, 23.5, 23; ear, 17, 15.5.

Skulls:—Greatest length, 34.7, 34.9; condylo-basal length, 33.8, 33.1; basal length, 31.4,—; palatal length, 18.5, 18; upper tooth row (alveoli), 18, 17.2; p^1-m^3 (alveoli), 8, 8.1; median nasal length, 12.2, 12; interorbital constriction, 8, 8.6; zygomatic breadth, 18.2, 18.8; length of mandible, 25, 25 mm.

10. *Petaurista lylei* BONHOTE.

Kloss, Journ. N. H. S. Siam, II, p. 302 (1917); Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 30 (1917).

2 ♂ ad. from Sikawtur, N. W. of Raheng, W. Siam, 1,500 ft. [Nos. 2652-3/CBK.]. Collected by Mr. K. G. Gairdner, 28 May 1917. Orig. Nos. 452-3.

1 ♂ ad. Pa Meang, Me Nga, N. N. E. of Lakon Lampang, North Siam, 2,000 ft. [No. 2663/CBK.]. Messrs. Williamson and Smith's collectors. 3 Nov. 1917.

I have already given a description of this animal in the Journal; in two of the specimens the black behind the ears and on the limbs and tail is browner and less intense than in the others, and the under body of the Me Nga specimen is altogether paler, being whitish on the axillae, sides, abdomen and base of tail.

The nasals vary considerably; their combined breadths in the three specimens are respectively 13, 16.6, 15.4 mm.

(For measurements see table *postea*.)

11. *Hylopetes phayrei phayrei*.

Sciuropterus phayrei, Blyth, Journ. Asiat. Soc. Bengal, XXVIII, p. 278 (1859).

1 ♀ aged, from Kanburi district, Western Siam [No. 2670/CBK.]. Obtained by Dr. Malcolm Smith's collectors.

This flying-squirrel appears to be an example of *H. p. phayrei* (type locality, Rangoon) though it is practically of the same size as the next race which Mr. Thomas says is larger than the typical form.

Above, base of fur deep neutral grey, middle portion of hairs dusky drab, tips cinnamon buff, the upper sides of the limbs and membranes browner and less overlaid with the latter colour and the hair less grey at the base. Muzzle greyish; cheeks, sides of neck, edge of membranes and entire under surface of body and limbs white or creamy-much of the fur pale grey at base. Hands and feet dusky drab grizzled above with buffy, pale buffy along the sides. Tail dusky drab through, out above and below at the tip, but much paler beneath basally.

(For measurements see table below).

12. *Hylopetes phayrei laotum*.

Sciuropterus phayrei laotum, Thomas, Journ. Bombay N. H. S., XXI, p. 28 (1914) [North Siam].

Sciuropterus phayrei, Bonhote, P. Z. S. 1900, p. 193 [Nan].

1 ♀ ad. from Raheng town, W. Siam, 450 ft. [No. 2614/CBK.]. Collected by Mr. K. G. Gairdner on 25 Jan. 1917. Orig. No. 353.

1 ♂ ad., 1 ♀ imm. from Me Taw, N. W. of Raheng, 1,500 ft. [Nos. 2613, 2651/CBK.]. Collected by Mr. K. G. Gairdner on 13 June 1917. Orig. Nos. 455, 454.

The appearance of these specimens is as follows:—

Adult female: Upper parts grey at base and dusky drab towards the tips which are orange-cinnamon on the top of muzzle and head, middle line of nape and on the back; on the limbs and membranes the light tips are much less numerous and become paler or albescent. Cheeks, lower sides of neck, a line beneath the ears towards the back of the nape, entire under-parts of body and limbs white or creamy, very slightly greyish at the base of the hair in places.

Hands and wrists buffy white, feet buffy on the digits and half-way towards the ankles. Tail cinnamon tinged with brown, paler below at the base. Mammæ 3-3=6.

Adult male: Like the preceding but much duller; the upper parts washed with pale cinnamon-buff instead of orange-cinnamon; muzzle greyish buff; limbs and membranes blackish brown instead of dusky drab. Hands and feet darker, the white confined to the edges and the digits. Tail dull brown above, darkest at the end; brown and buff below.

Immature female: Like the male but much darker (as in all young flying squirrels apparently) owing to the fewer buffy tips to the hairs; the grey bases on the belly are more pronounced and the feet are much darker throughout.

Mr. Thomas has also described (*t. c. s.*, p. 27) another race, *H. p. probus*, from Mt. Popa, Central Burma, from which *H. p. laotum* is stated to differ in having the hands and feet less extensively white and the under parts less pure white and more mixed with slaty: it is also larger. The adult female so closely accords in these respects that one would be inclined to refer it to the Burmese form, if it had not been obtained so near the type locality of *H. p. laotum*, with which race the male from Me Taw agrees.

Measurements of *H. p. phayrei* and *H. p. laotum* in millimetres.

No.	2670 ♀	2614 ♀	2613 ♂	2651 imm.
Head and body	166	167	165	—
Tail	158	151	150	—
Hind foot	31	35	33.5	32
Ear	24	25	25	—
Skull				
greatest length	41.3	42	41.5	—
condylo-basilar length	34.7	35	34.7	—
basilar length	31.9	32.1	31.1	—
palatilar length	18	18.1	18.5	17
diastema	8.8	8.5	8.9	7.1
upper molar row (alveoli)	8.7	8.9	8.6	9
nasals	11.2 × 6.9	12 × 6	12 × 6.4	10.3 × 5.8
interorbital breadth	9.4	8.9	8.5	8.9
zygomatic breadth	25.5	25	25	22.2
mastoid breadth	19	20	18.7	—

13. *Ratufa gigantea*.

Sciurus giganteus, McClelland, P.Z.S. 1839, p. 150.

Ratufa gigantea, Bonhote, P.Z.S. 1900, p. 193 (Nan).

1 ♂ ad. from Me Puan, N. N. E. of Lakon Lampang, N. Siam 1,500-2,000 ft. [No. 2664/CBK.]. Messrs. Williamson and Smith's collectors. 26 Nov. 1917.

This animal differs from *Ratufa melanopepla* and its allies, *phaeopepla* and *leucogenys*, which are more common in Siam, in having tufted ears, while the buff of the forelimb is confined to the inner side, instead of extending over the upper surface behind the wrist. Typically it is also larger.

The black upper parts of the present specimen are slightly tinged with dark brown on the occiput and thighs, and there are about a dozen white hairs at the tip of the tail.

Originally from Assam, *R. gigantea* has already been obtained from North Siam* and is known from the North Shan states and Northern Burma.† Under *Ratufa bicolor* (P.Z.S. 1900, p. 355) Flower states that he thought he could distinguish through field-glasses tufted ears on an animal near Krabin, Bangpakong River, but it is unlikely that *R. gigantea* extends so far south. A local form, *R. g. lutrina* Thos. & Wr. (Journ. Bombay N. H. S., XXIV, 1916, p. 226) occurs opposite Kindat on the Upper Chindwin, Burma.

(For measurements see table *postea*.)

14. *Sciurus caniceps caniceps* GRAY.

Sciurus caniceps, Kloss, Journ. N. H. S. Siam, II, pp. 18,83 (1916).

1 ♂ subad. from Me Wang, N. N. E. of Lakon Lampang, North Siam [No. 2677/CBK.]. Obtained by Mr. W. J. F. Williamson's collectors. 29 Oct. 1917.

This specimen is assuming the winter pelage; the grizzled grey nape, back and sides are tinged with yellow, and there are present some spots and patches of orange ochraceous; the tail is suffused with yellow and tapers towards the end where there is a large tuft of black hair; the limbs are grey, hands and feet whitish and the under parts greyish white with a grey median stripe.

(For measurements see table *postea*.)

* Vide Wroughton, Journ. Bombay N. H. S., XIX, p. 890 (1910)

† Wroughton, op. cit. XXIII, p. 462 (1915).

15. *Sciurus atrodorsalis* thai.

Kloss, Journ. N. H. S. Siam, II, p. 285 (1917).

1 ♀ ad., 1 ♂ ad., from Sikawtur, N. W. of Raheng, W. Siam, 1500 ft. [Nos. 2646,7/CBK.] Collected by Mr. K. G. Gairdner, 3 Feb. and 16 May 1917. Orig. Nos. 350, 427.

These two specimens differ from the type series in having the muzzles more buffy than ochraceous, and the ears and the ring round the eyes paler. One is similar below but the other has the throat and foreneck grey and the chest yellow, while the middle abdomen is suffused with yellow and there are stripes of the same colour on the front of the hind legs between the grizzled and rufous areas; its tail is a deeper buff distally. A trace of yellow is also present on the chest of an animal of the typical series.

The type female, though an adult with worn teeth, is a little below the average in size.

(For measurements see table *postea*).

16. *Sciurus nox* WROUGHTON.

Kloss, Journ. N. H. S. Siam, II, p. 17 (1916).

2 ♂ ad. from Nong Khor near Sriracha, S. E. Siam [Nos. 2520,1/CBK.] Obtained by Mr. W. J. F. Williamson's collector on 13 and 14 July, 1916.

Practically topotypes of the jet-black Siamese squirrel. No measurements have been recorded in the field and the skulls have been damaged by cutting away the backs.

17. *Sciurus bocourti bocourti* M-EDW.

Kloss, Journ. N. H. S. Siam, II, pp. 17, 309 (1916-7).

1 ♂ ad. from Bang Pa In near Ayuthia, Central Siam [No. 2678/CBK.]. Collected by Dr. Malcolm Smith. 1 Feb. 1918.

Above a grizzle of black and buff, warmest on the nape, darkest on rump and tail. Ears, top and sides of muzzle, cheeks and above eyes, sides of neck, sides of forelimbs and upper surface of forearms, lower sides and ankles white; fore and hind feet greyish. Entire under parts including base of tail white. Tail above coarsely grizzled black and buff with numerous white hairs, below pale greyish.

(For measurements see table *postea*).

18. *Sciurus finlaysoni folletti*.

Kloss, Journ. N. H. S. Siam, I, p. 159 (1915).

3 ♂, 5 ♀ ad. from Koh Phai, Inner Gulf of Siam [No. 2522-9/CBK.]. Obtained by Mr. W. J. F. Williamson's collector on 16-18 July 1916.

These specimens exactly agree with the typical series collected in February, showing that no seasonal change in colour takes place. In one example there are marked chestnut areas on axillae, groin and along the sides of the abdomen; in the others the reddish patches are very faint and confined to axillae and groin.

No external dimensions have been recorded and as the backs of the skulls have been cut away by the collector I have not taken any measurements of these either. For the size of this race see table, Vol. I, p. 162.

19. *Tamiodon maccllellandi kongensis* (BONHOTE)

Tamiodon barbei kongensis, Kloss, Journ. N.H.S. Siam, II, pp. 84, 310, (1916-7).

1 ♀ aged. Lakon Lampang town, N. Siam [No. 2679/CBK.]. Obtained by Dr. Malcolm Smith's collector. March 1917.

1 ♀ vix ad. Ban Phong Tham, N. N. E. of Lakon Lampang, N. Siam [No. 2680/CBK.]. Obtained by Messrs. Williamson and Smith's collectors. 2 Sept. 1917.

1 ♂ imm. Ban Me Yen, N. N. E. of Lakon Lampang, N. Siam. [No. 2665/CBK.]. Obtained by Dr. Malcolm Smith's collector. Sept. 1917.

The specimens from Lampang town and Ban Phong Tham (March and September) are in the dull winter pelage described in Vol. II, p. 310; that from Ban Me Yen is in the brighter summer phase (vide Vol. II, p. 84).

The animal from Lampang town is an old individual with well worn teeth and is by far the palest and largest specimen I have seen.

Immature animals seem much more richly coloured below than adults, the under parts being salmon-buff to pinkish cinnamon.

(For measurements see table *postea*).

20. *Rattus lepidus*.

Epinys lepidus, Miller, Smithsonian Miscellaneous Collections, 61, p. 20 (1913). [Bok Pyin near Victoria Point, S. Tenasserim].

1 ♀ ad. from Meh Lem near Muang Prae, N. Siam [No.

2092/CBK.] Obtained by Messrs. Williamson and Smith's collectors on 11 April 1916.

Some of the lesser known spiny rats, with upper parts varying between tawny and clay colour and with sharply margined white under parts, are not easy to identify without reliably determined material to compare them with and therefore—though this specimen appeared to be *Rattus lepidus*, known hitherto from one adult only—I sent it to Mr. Gerrit S. Miller, in whose charge the type is, with a request for his opinion; at the same time drawing attention to the size of the ears. Mr. Miller has very kindly replied as follows:—

“I have compared the specimen with the type of *Rattus lepidus* and find that the two are virtually identical in all important characters. All the differences, except perhaps that in length of ear, are such as might be expected to be shown by individuals of one species from one locality. Dr. M. W. Lyon looked at the specimens with me and is of the same opinion.

“The differences are:—(a) ear; yours measures now a little over 21 mm., while ours are about 17.5, but the treatment of the two specimens was so different (the ears of yours having been spread out while drying while those of ours were allowed to shrink) that without more material I should not lay stress on these 3 or 4 mm; (b) fur; yours is less spiny (might be described as having spines mixed with the hairs, while ours has hairs mixed with the spines); (c) colour; underparts just perceptibly more yellow, the differences more noticeable on the throat than elsewhere; sides and upper parts identical except that in the type of *lepidus* the more abundant spines give a “horny” cast; (d) braincase and ante-orbital plate, a hair's-breadth narrower in your specimen; (e) bullae of your specimen slightly more inflated so that the beak is less prominent. There are no others that I can detect”.

The present specimen has the following appearance:—upper-parts ochraceous tawny darkened on the back by the tips of the spines and rather greyish on the sides and limbs through exposure of the base of the fur; cheeks buffy. Below cream colour throughout. Hands and feet white, the latter separated from the creamy part of the hind leg by a hair-brown area above the ankle. Tail dark above and white below, the hair in agreement except at the tip where it is pale

all round. Base of hair on upper parts neutral grey, of dorsal spines pale with a greenish tinge.

Native collector's external measurements:—head and body, 134 (140)*; tail, 164 (159); hind foot, s.u., 29 (26); ear 24.

Skull:—greatest length, 36; condylo-basal length, 31.4 (31.4); condylo-basilar length, 29.8; palatilar length, 15.2; diastema, 9.1 (8.3); upper molar row, alveoli, 6 (6); nasal length, 13.4 (13) breadth combined nasals, 4; palatal foramina, 6×2.3 ; greatest breadth of rostrum 6 (6.2); length of rostrum from upper rim of ante-orbital foramen, 11.8 (11.4); interorbital breadth 5.3 (5.8); zygomatic breadth, 16 (16.3).

The palatal foramina fall short of the molar roots by nearly a millimetre.

Rattus marinus mihi, from Koh Chang and Koh Kut, Chantabun Archipelago, S. E. Siam,† will probably prove to be a subspecies of *lepidus* when more of the latter have been compared with it. A series only differs from the present animal in having the feet less completely white, while in the skulls, the nasals are narrower posteriorly and the diastema is longer (*lepidus* 8.3—9 : *marinus* 9.2—10.1 mm.).

Rattus lepidus and *marinus* are members of a group of rats easily separated from other species of the same general colour by the pale green bases of the dorsal spines. Some other continental animals belonging to it are *R. bukit* (Bonh.) and *R. orbus* (Robinson and Kloss) from Peninsular Siam and *R. cremoriventer* (Miller) from the same area with its subspecies *R. c. tenaster* (Thomas) from Muleyit, Texas-serim; the two last, however, form a distinct section of the group as the tail is more hairy and brown throughout, not white below.

21. *Rattus concolor*.

Mus concolor, Blyth, Journ. Asiat. Soc. Bengal, XXVIII, p. 295 (1859); Bonhote, P. Z. S. 1900, p. 195; id. op. cit. 1902, vol. 1, p. 39; Gyldenstolpe, Arkiv för Zoologi, 8, No. 23, p. 18 (1914).

Epimys concolor, Kloss, P. Z. S. 1916, p. 57.

Rattus concolor, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl. 57, No. 2, p. 45, pl. VI, figs. 5, 8 (1917).

1 ♂, 1 ♀ vix ad. from Raheng town, Western Siam, 450 ft. [Nos. 2680, 1/CBK.]. Collected by Mr. K. G. Gairdner.

Two large specimens with unworn teeth of the little spin_y

* Measurements in parentheses those of the type—also an adult female

† *Epimys jerdoni marinus* Kloss, P. Z. S. 1916, pp. 50, 72.

house-rat: underparts much washed with buffy in both.

Measurements:—head and body, 115, 115; tail, 147, 141; hind foot, s.u, 27, 25; ear, 15, 16. Skull (male only):—greatest length, 31; condylo-basal length, 27; palatilar length, 14.4; diastema, 8.4; upper molar row (alveoli) 4.9; length of palatal foramina, 5.2; length of nasals, 13; interorbital breadth, 4.8; breadth of braincase, 13.3; zygomatic breadth, 15 mm.

22. *Rattus rattus thai*.

Rattus rattus thai, Kloss, Journ. N.H.S. Siam, II, p. 286 (1917).

Mus rattus, Bonhote, P. Z. S. 1900, p. 194; id. op. cit. 1901, vol. I, p. 56.

2 ♂ ad, 3 ♂ subad., 3 ♀ ad., 2 ♀ subad. from Sikawtur and Me Taw, N. W. of Raheng, W. Siam, 1500 ft [Nos 2639-45, 2666-8/CBK.]. Collected by Mr. K. G. Gairdner between 3 Feb. and 3 July 1917. Orig. Nos. 355,6; 360,1; 375, 390, 458.

A typical series of the Northern Siamese common rat, rather brighter above than *R. r. neglectus* of the south and with twelve, instead of ten, mammæ in the females.

"The rutting season seems to be January—February." Of July examples Mr. Gairdner notes: "Reappeared after the hot weather."

(For measurements see table *postea*).

23. *Tautatus thai*.

Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 280 (1917).

1 ♂ ad. from Me Taw, 1500 ft, 40 miles N. W. of Raheng, Western Siam [No. 2617/CBK.] Collected on 9 Feb. 1917, by Mr. K. G. Gairdner. Orig. No. 369.

Pelage spineless, composed above of coarse and fine hairs, the stiffer tipped with black, the softer with bright ochraceous-buff; the general colour effect of the upper parts being ochraceous-buff finely streaked and lined with black, the latter diminishing in quantity on the sides: base of upper pelage deep neutral grey. Hands and wrists, feet and entire under-parts white apparently fairly clearly margined, the fur of the under-parts distinctly dark grey at base. Tail dark above and paler below, the hair clothing it in agreement.

Nasals extending just within the line of the orbital spaces and not exceeded posteriorly by the præmaxillaries. Anteorbital plate markedly convex, the lower part of the edge vertical. Palatal for-

amina narrow and elongate with their greatest breadth in front of their mid-length, pointed posteriorly and terminating (as in *Mus*) within the line joining the anterior roots of the molars which are nearly vertical in front: tooth rows parallel. Mesopterygoid space falling short of the last molars by nearly a millimetre and apparently very narrow (but base of braincase and the bullæ missing).

Measurements: Head and body, 89; tail, 85; hindfoot, 19; ear, 14.5 mm.

Skull:—palatilar length, 11.0; diastema, 6.7; upper molar row (alveoli), 4.0; length of palatal foramina, 4.6; nasals, 8.1×2.5 ; zygomatic breadth, 11.9 mm.

Remarks. This second example of *Tautatus thai* is older and larger than the type and more ochraceous above. Its advent shows that in respect of the incisors the genus does not differ from *Mus*, as stated, since distinct notches are present. It is otherwise distinguished as recorded (*t. c. s.*, p. 279) while, further, in *Mus* the posterior branches of the præmaxillaries are continued beyond the ends of the nasals.

24. *Nyctocleptes sumatrensis cinereus* (McClelland).

Nyctocleptes cinereus, Kloss, Journ. N. H. S. Siam, II, p. 314 (1917).

1 ♂ skin and skull, Chiangmai, N. Siam [No. 2683/CBK.].

Obtained by Mr. W. J. F. Williamson's collector.

1 ♀ skull, Sikawtur, N. W. of Raheng, W. Siam, 1,500 ft. [No. 2654/CBK.]. Collected by Mr. K. G. Gairdner. Orig. No. 464.

General colour of body and limbs pale dull buff, many of the hairs, especially on the back, with a dark brown subterminal annulation and a pale shining tip. Fore and hind feet dull brown. Top of head with a broad blackish brown stripe disappearing on the nape; throat buffy, foreneck dull brown; rest of head ferruginous or ochraceous. Tail naked.

In colour this race seems much more nearly to resemble the young of *N. s. sumatrensis* of the south of the Malay Peninsula than it does adults of that form which become a dirty buff with a dark mark on the crown.

Collector's external measurements of the Chiangmai specimen:—Head and body, 395; tail 130; hind foot 64 mm.

Skulls:—greatest length (*i. e.* condylo-basal), 77.5, 71; basilar length, 68, 61; palatilar length, 42.3, 37; diastema, 27, 23; upper molar row (alveoli), 15.4, 14; width of posterior nares, 5, 6.1; breadth of combined nasals, 12.8, 10; greatest breadth of frontals, 27, 23; inter-orbital constriction, 14.8, 12.8; zygomatic breadth, 60, 53 mm.

In the smaller animal the occipital plane is much further from the perpendicular than in the other and the bullae are more dilated.

25. *Acanthion brachyurus klossi*.

Acanthion klossi, Thomas, Ann. & Mag. Nat. Hist. (8) XVII, p. 136 (1916); Kloss P. Z. S. 1916, p. 60.

2 ♀ subad. purchased in Bangkok by Mr. J. J. McBeth and stated to have come from south-west of Ratburi on the Meklong River. [Nos. 2684, 5/CBK.].

A narrow crest of long slender bristles, white for half their length, extending from the crown to behind the shoulders; an oblique white stripe on the neck from the back of the throat to front of shoulder and a few whitish annulations on the nape. Posterior parts of back and sides and upper surface of tail clothed with white quills having a single black ring of varying width, and also with a few slender flexible quills white throughout. Tail whitish below. All the remaining parts dark brown, blackish on the limbs. Rattle at end of tail consisting of slender stems each bearing a single hollow capsule.

Both specimens are in perfect condition externally but unfortunately neither is full grown.

Collector's external measurements:—head and body, 660, 400; tail, 135, 115; hind foot, 87, 82; ear 32, 32 mm.

Skulls:—upper length (\pm) 126, 119; condylo-basilar length, 113, 109; diastema, 32, 30; upper molar row (alveoli), 28.6, 26.2; length of nasals, 63, 63; breadth of combined nasals, 35.5, 35; length of frontal suture, 30, 27; zygomatic breadth, 67, 66.5 mm.

26. *Manis javanica*.

Manis javanica, Desm., Mamm., p. 377 (1822); Blanford, Fauna Brit. Ind., Mamm., p. 599 and fig. 199 (1891).

1 ♂ ad. stated to have come from south-west of Ratburi, Meklong River. Collected by Mr. J. J. McBeth. [No. 2686/CBK.].

An exceptionally fine aged example with an unusual number of longitudinal scales.

Longitudinal rows of scales round the body, 23; total number of scales in the longitudinal line, 63; number of scales in the upper median line of the tail only, 28.

Measurements:—head and body 570; tail 523; greatest length of skull, 109; basal length of skull, 103; greatest breadth of skull, 41 mm.

Immature example: captive animal in Bangkok. Obtained by Dr. Malcolm Smith [No. 2687/CBK.].

Scales round body, 19; total number in longitudinal line, 60; scales above tail only, 28.

Measurements of Siamese *Tupaia*s in Millimetres.

Species and Locality.	Sex	Head and body	Tail	Hind foot s. u.	Ear	SKULL								No.	Remarks
						Greatest length	Basal length	Palatal length	Tip of pre-maxillaries to alveolar notch	Upper molar series (alveoli)	Rostral breadth at diastema	Inter-orbital breadth	Zygomatic breadth		
<i>Tupaia glis belangeri</i>															
Me Nga, N. Siam	♂	170	174	39	15*	51	43.8	26.2	20	15	6.9	14	26.3	2659	Adult.
Sikawtur, W. Siam	♂	183	165	41	15	51	...	27	21	15	7	13.8	25	2657	"
"	♀	...	184	41	15	47.8	...	25.8	19.2	15.2	6.2	12.9	25	2658	Vix ad.
"	♀	181	180	42.5	17	49	43.6	25.3	19.5	15.2	6.7	12.9	24.9	2659	Adult.
Hua Hin, S. W. Siam	♂	161	156	41	16*	48.4	42.5	25.8	19	14.9	6	13.4	25	2543	"
Pran River Mouth, "	♀	170	155	40	14*	47	40.3	24.2	18	14.6	6.1	13	24	2544	Vix ad.
<i>Tupaia glis clausa</i>															
Chumporn River Mouth, S. W. Siam	♂	160	175	45	14*	49	42	25.2	21	14.9	7	13.1	24	2552	"
"	♂	170	155	43	*	...	...	27.8	23.5	15.1	6.8	14	24.2	2553	Adult.

* External measurements by native collector.

Measurements of Siamese Squirrels in Millimetres.

Species and Locality	Sex	Head and body	Tail	Hind-foot s. u.	Ear	SKULL							No	Remarks
						Greatest length	(Condylar length)	Palatal length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter-orbital breadth	Zygomatic breadth	
<i>Petaurista tyleri</i>														
Sikawtur, W. Siam	♂	495	550	80	47	78	69	37	17	17.2	25.5	17.3	52	Adult.
"	♀	494	550	88	47	79	70.5	37.2	17.2	18.1	24	17.1	50	"
Pa M'ang, Me N'ga, N. Siam	♂	80	69	35.5	16	19.3	22	18.5	50	"
<i>Ratufa gigas</i>														
Me Puan, N. Siam	♂	382	290	86	31*	77	64.4	28.7	16	15	24.4	30	46.5	"
<i>Sciurus caniceps</i>														
Me Wang, N. Siam	♂	245	250	49	21*	59	51	25	14	11.7	18	21	34	"
<i>Sciurus atrocaudatus thai</i>														
Sikawtur, W. Siam	♂	54	45	22	11.6	10.2	16	18.1	32	"
"	♀	210	180	42	17	53	44	22	12	10	15.2	17.9	30.6	"
Raheng, Central Siam†	♀	208	220	47	19	52	43.5	21	10.2	11	15.7	17.8	30	Subad.
<i>Sciurus buccurri buccurri</i>														
Bang Pa In, near Ayuthia, C. Siam	♂	46	22	48	41	20.7	11	9.8	14.5	18.2	29.6	Adult.
<i>Tamias macclellandi kongensis</i>														
Lampang town, N. Siam	♀	34.6	28.9	13.8	7.5	6.0	9.6	12.9	21	Aged.
Ban Phong Tham, " "	♀	113	113	26	11*	31.6	26	13	6.9	5.9	8.4	11.7	19.1	Vix ad.

* External measurements by native collector.

† Paratype.

Measurements of Siamese Rats in millimetres.

Species and Locality	Sex	Head and body	Tail	Hind-foot s. u.	Ear	SKULL.							No.	Remarks
						Greatest length	Condylar length	Palatilar length	Diastema	Upper molar row (alveoli)	Length palatal foramina	Nasals	Zygomatic breadth	
<i>Rattus rattus thai</i>														
Sikawtur and Me Taw,														
W. Siam	♂	34	21	44	...	21	10.9	7.4	8.6	17 × 4.4	20.5	2639 Adult.
"	♂	174	171	31	22.5	40.2	35.5	19.3	10.4	7.5	7.7	14.2 × 4.3	20.2	2640 Subad.
"	♂	186	195	32	22	...	...	...	...	...	...	...	...	2641 "
"	♀	172	193	33	21.5	41	35.5	19.2	10.8	7.1	7	15 × 4.8	19.8	2643 "
"	♂	173	173	31.5	22.5	41.3	35.8	19.1	10.9	7.2	8.7	15 × 4.6	19.8	2645 Adult.
"	♀	43.8	...	20	11	8	7.3	15.2 × 5	22	2666 "
"	♀	42.3	37.8	21.1	11.6	7	7.9	14.6 × 4.6	20.2	2667 "
"	♀	20.1	11	8	7.9	16.1 × 5	21	2668 "

A NECESSARY AMENDMENT TO THE DESCRIPTION OF TAUTATUS.

BY C. BODEN KLOSS, F.Z.S.

The advent of a second and older specimen of *Tautatus thai* (antea, p. 63) renders it necessary to amend the definition of the genus* which should be as follows:—

GENUS *Tautatus*, descr. emend.

Skull with superficial resemblance to *Mus* but the rostrum shallower and no masseteric knobs at the anterior bases of the zygomatic plates. No raised supraorbital ridges, the edges even more round than in *Mus*. Palatal foramina long, extending posteriorly well between the first molars; palate extending well beyond the posterior extremities of the last molars. Mesopterygoid space normal, slightly diverging posteriorly. Bullæ of medium size.

Incisors notched and upper molars with proportions as in *Mus*, m^1 being longer than m^2 and m^3 combined; but laminae of m^1 less distorted, the inner tubercles less posteriorly situated. The remaining molars of more angular outline: the anterior edge of m^2 straighter owing to the more advanced position of the antero-internal tubercle; the internal edge short and followed by an oblique postero-internal edge almost concave: antero-internal point of m^3 forming the apex of a markedly triangular tooth.

External characters apparently not peculiar: fur dense, rather long and stiff but not mixed with flattened spines. Hind-foot with fifth toe reaching to the middle of the basal phalanx of the fourth. Only the pollex with a flat nail. Ears of medium size.

The principal differences from *Mus*, therefore, lie in the absence of the masseteric knobs and the less distorted form of the molars. In the specimens examined the premaxillaries do not extend beyond the posterior terminations of the nasals and this may possibly constitute another character.

* Journ. N. H. S. Siam, II, p. 279 (1917).

THREE NEW MAMMALS FROM SIAM.

BY C. BODEN KLOSS, F.Z.S.

1. *Paguma larvata vagans*, subsp. nov.

Type. Skin of female, No. 2655/CBK. Collected at Sikawtur, 40 miles N. W. of Raheng, Western Siam, 1500 ft., on Feb. 27th, 1917, by Mr. K. G. Gairdner. Original number 374.

Characters. Differs from *Paguma larvata intrudens* Wroughton, from Myitkyina, North Burma,* in having the hair of the upper parts tipped with black instead of buff, the white stripe not extending beyond the neck, the pale spot above the eye confluent with the patch below the ear, the fore-neck cream, the ventral surface creamy with pale grey bases to the hairs except on the fore-neck and posterior abdomen where the fur is unicolorous, and the hind legs strongly tinged with ochraceous on their inner sides.

Fur of two kinds on the upper surface:—a woolly under-fur of a drab colour, sometimes tipped with buffy; and longer harsher hairs with drab bases succeeded by a black and a buffy annulation and a black tip.

Colour. A creamy stripe, broadest on the face, extending from the muzzle to the end of the nape; a creamy spot below the eyes; from above the eyes a creamy area extending beneath the ears downwards to the fore-neck.

Rest of head with ears, cheeks, chin and throat blackish brown, this colour bordering the pale stripe and dying out on the shoulders. Fore and hind feet blackish brown.

Remainder of upper parts and limbs pale smoky grey suffused with buffy, the black annulations very narrow, the black tips most marked along the middle line of the back; rump washed with isabelline and inner sides of hind limbs with ochraceous.

Throat and posterior abdomen creamy to the bases of the hairs; the rest of the under body paler, the hairs with pale grey bases.

Tail with proximal half like the rump, becoming blackish brown distally where only the base of the fur is buffy; extreme tip creamy.

* Wroughton, Journ. Bombay N. H. S., XIX, p. 793 (1910); Ryley, *ibid*, XXII, p. 720 (1914).

[Colour of soft parts. Nose, liver brown ; feet, black ; genital skin, white. Mammaræ, 2 pairs only found. Pads of hind-feet, 33 mm. in width. K. G. G.].

Measurements. Head and body, 610 ; tail, 575 ; hindfoot, 74 ; ear, 50 mm. Of the skull I am unable to give any details as it was carried off by some animal while drying : it probably possessed no characters that would differentiate it from neighbouring races.

Remarks. Animals from South Tenasserim and Bandon, Peninsular Siam, connect this race with *robusta* Miller, from Trang* ; they are not so dull as *vagans* but less fulvous and buffy than the other, and the nape stripe is faintly indicated : they do not appear distinct enough, however, to justify the bestowal of a name.

2. *Rattus griseiventer rahengis*, subsp. nov.

Types. Male vix ad. and female ad. from Me Taw, 40 miles N. W. of Raheng, W. Siam, 1500 ft [Nos. 2637, 8/CBK]. Collected by Mr. K. G. Gairdner on 2 Feb. 1917. Orig. Nos. 459, 460.

Characters. Differs from *Rattus griseiventer* (Bonhote) in being more woolly (less spiny) and much darker above ; hands and feet white throughout, not largely brown. Mammaræ 3-3=12.

Colour. Above dark brown grizzled with ochraceous tawny, sides and limbs greyish brown ; under-parts neutral grey washed with creamy in the male, with pale buff in the female. Tail dark throughout : ten rings to the centimetre at the middle.

Skull and teeth. Compared with that of *R. g. griseiventer*, the skull has the nasals much longer, pointed posteriorly and extending backwards well beyond a line joining the front borders of the orbital spaces ; bullae smaller, less dilated and narrower : the teeth larger.

The palatal foramina extend about .5 mm. behind a line joining the roots of the molars, the tooth rows diverge posteriorly and the front edge of the anteorbital plate is convex and overhangs the base (considerably in the female).

Remarks. I have referred these animals to *R. griseiventer* (Bonhote) but it should not necessarily be inferred that I regard the latter as the true superform of the species to which both belong : they

* *Paradorurus robustus* Miller, Proc. Biol. Soc. Washington, xix, p. 26 (1906).

seem, however, related to it, and it is the earliest, undoubtedly allied race, I am able to compare them with for the moment.

For comparison, the dimensions of the type of *R. rubricosa* (Anderson, Zool. Res. Yunnan, p. 306) from the country between Bhamo and Momein, are given: though also a grey-bellied rat, it will be seen that it is a far smaller animal; the skull of *R. g. rahengis* is heavy with strong ridges whereas the other's looks more like that of a gigantic *R. concolor*.

Measurements of Rats in millimetres.

	<i>R. griseiventer rahengis</i> ♂	<i>R. griseiventer rahengis</i> ♀	* <i>R. griseiventer griseiventer</i> ♂	† <i>R. rubricosa</i> ♂
Head and body	190	208	205	140
Tail	174	194	190	130
Hindfoot, s. u.	34	37	35	32
Ear	19.5	21	20.5	—
Skull:—				
greatest length	44.3	45.2	45	37.5
condylo-basilar length	38	39.8	39	32.1
palatilar length	—	22	20.8	17.5
diastema	12	12.5	12.4	10
upper molar row (alveoli)	7	7.9	6.8	6.8
combined palatal foramina	8.1 × 2.8	8.9 × 2.8	8.6 × 3	7.3 × 2.2
m ³ —m ³ (alveoli)	5.1	5.3	5	4.1
nasals	18 × 5	18.5 × 5	16 × 5	14.8 × 4
interorbital breadth	6	6	6.7	5.4
brain case breadth	17	17	16.5	15.7
zygomatic breadth	20.8	20.1	20.1	17.2

3. *Rattus rajah siarma*, subsp. nov.

Rattus surifer, Gyldenstolpe (partim), Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 42 (1917) [Koon Tan, N. Siam].

Type. Adult male (skin and skull) from Sikawtur, 40 miles

* Male with very worn teeth from Plentong River, S. Johore, Malay Peninsula, No. 2539-08. F. M. S. Mus.

† Teeth considerably more worn than No. 2637, slightly more worn than No. 2368.

N. W. of Raheng, W. Siam, 1500, ft. [No. 2632/CBK.]. Collected by Mr. K. G. Gairdner on 13 March 1917. Orig. No. 399.

Diagnosis. Slightly darker than *R. rajah finis** from S. E. Siam and with shorter nasals: these are more truncate posteriorly and always, apparantly, fall decidedly short of a line joining the front extremities of the orbital spaces; in *finis* the nasals are nearly always protracted backwards beyond such a line, and the ends are more rounded or pointed: in the present race the posterior ends of the premaxillaries are also less oblique. This form is duller above than *R. rajah surifer* (Miller) of Peninsular Siam.

Specimens examined. Six from the type locality and Me Taw, 1500 ft., closely adjacent [Orig. Nos. 364, 376, 398, 405.], and another from the Pa Wa Gorge, N. Siam [Orig. No. 228], all collected by Mr. Gairdner.

* *Epimys surifer finis*, Kloss, P. Z. S. 1916, pp. 51, 73.

Measurements of *Rattus rajah siamæ*.

Locality	Sex	Head and body	Tail	Hind-foot s. u.	Ear	SKULL								No.	Remarks
						Greatest length	Condylar length	Palatilar length	Diastema	Upper molar row (alveoli)	Length palatal foramina	Nasals	Zygo- matic breadth		
Sikawtur and Me Taw, W. Siam...	♂	198	204	40	23.5	45.5	...	19	12.9	6.6	6	16.6 × 4.8	20	2629	Adult.
"	♂	150	173	38	21.5	41.3	34.5	17.1	11	6.5	5.9	15 × 4.5	19	2630	"
"	♀	44.8	37	18	12.2	6.2	6.1	16.5 × 4.4	20	2631	"
"	♂	177	186	40	22	44.5	36.5	18	12	6.3	5.9	15.6 × 4.2	19	2632	" Type.
"	♀	171	161	34	22.5	42	35.2	17.7	11.5	6.6	6	15.1 × 4.1	19.1	2633	"
"	♀	11.3	6.4	6.3	16.1 × 4.2	...	2634	"
Pa Wa Gorge, N. Siam ...	♀	171	168	37	19	41.7	...	17	11.3	6.2	5.3	15.1 × 4.6	20	2506	"

NEW AND OTHER WHITE-TOOTHED RATS FROM SIAM.

BY C. BODEN KLOSS, F.Z.S.

Mr. K. G. Gairdner, C.M.Z.S., has sent me three examples of this interesting Indo-Chinese group of rats, some of which are very little known and are difficult to determine in the absence of direct comparison with topotypes.

The first of the specimens is a member of the species *Rattus berdmorei* (Blyth) and is easily separated from the other two on account of its darker, greyer upper-parts, more projecting upper incisors, which are practically without any backward curve, and very large bullae. It is apparently only the third known specimen of

1. *Rattus berdmorei mullulus* (Thomas).

Mus berdmorei, Thomas (partim) Ann. Mus. Civ. Genova (2a) x (xxx), p. 938 (1892). [Thagata, Muleyit Range, Tenasserim].

Epimys berdmorei, Kloss P. Z. S. 1916, p. 59 [Measurements of the above: type of *R. b. mullulus*].

Epimys berdmorei mullulus, Thomas, Journ. Bombay N.H.S., xxiv, p. 413, 14 (1916).

1 ♀ vix ad. from Me Maw near Lakon, North Siam [No. 2507/CBK]. Collected by Mr. K. G. Gairdner on 3 Oct. 1915. Orig. No. 224.

Fur consisting of shorter soft hair and longer slender, pliable, flattened spines.

Colour above clove brown with a frosted appearance caused by the pale buffy tips of the under fur and by the exposure of the pale basal portion of the spines; a distinct sheen on the back: sides of head, neck and body and the limbs, grizzled brownish grey. Fore digits practically naked, metapodials brownish white: hind feet white from the claws nearly to the ankles. Under-parts entirely white, this colour separated from the hind-feet by an indefinite narrow band of brownish grey. Tail apparently black throughout and clad with dark hairs.*

Mr. Gairdner notes, "Grey rat, tail shorter than body, tubercles on feet very pronounced: five prominent plantar pads and one small; on the fore-feet the lower plantar pads are larger than the thumbs. Ear rounded and large. Lower incisors long, slender and white."

* See also description of *Rattus berdmorei magnus* (Kloss, P.Z.S. 1916 pp. 57-9, fig. 1) from S. E. Siam, which is very similar in colour and type of skull.

Apart from smaller size the skull appears to differ from that of *R. b. magnus* in having the palatal foramina protracted backwards to a line joining the roots of the first molars, broader teeth and nasals truncated posteriorly.

(For measurements see table *postea*).

The other specimens differ from *R. b. mullulus* in larger size; browner, more warmly coloured upper parts; smaller bullae and upper incisors a little more curved toward the throat, but markedly less so than in orange-toothed rats. The larger of the two is related to *R. bowersi* (Anderson) from near Bhamo, Upper Burma, and *R. ferreocanus* (Miller) from Trang, Peninsular Siam. I have only been able to compare it with specimens of the latter, but Mr. Thomas and I have noted some differences between the two which, taken together, seem to indicate that *bowersi* is browner, less grey in colour, has the dark areas of the feet less extensive, larger bullae but smaller teeth.* In all these features Mr. Gairdner's specimen differs from *ferreocanus* in the same way, and I should call it *R. b. bowersi*, were it not that the latter is described as being "pale yellow below and on the feet and on the tip of the tail, distinctly defined from the darker colour..... This species is closely allied to those rats which are distinguished by yellow bellies." It is also figured as yellow below with no distinct line between the lower parts and sides, etc.† The present example is beneath white, clearly margined from the brown of the sides, as in *ferreocanus*, and I look upon it as a link connecting the two as races of one species and name it

2. *Rattus bowersi lactiventer*, subsp. nov.

Type. Adult male from Sikawtur, 40 miles N. W. of Raheng, W. Siam, 1500 ft. [No. 2635/CBK.] Collected by Mr. K. G. Gairdner, on 21 May, 1917. Orig. No. 433.

Differs from *R. b. bowersi* in being white, not yellow beneath, and from *R. b. ferreocanus* in being browner and warmer above and with a good deal of white on the feet; from both in having no pale tip to the tail.

* Thomas, Journ. Bombay Nat. Hist. Soc., XXIV, p. 410 (1916); Kloss, Records Indian Museum, XIII, p. 5 (1917).

† Anderson, Anat. & Zool. Researches, p. 304, pl. XVII (1878).

Pelage composed of soft woolly under fur and longer stiffer hairs, or spines not visibly flattened.

Colour above, glossy Natal brown grizzled by the pale buffy tips of the under fur, paler on the sides, fore-limbs and thighs; muzzle, cheeks, crown, sides of neck and the lower leg brighter, near Verona brown in colour; base of hairs neutral grey, of spines whitish. Below white throughout except the ankle, the white clearly margined from the brown of the sides, etc. Fore-digits whitish, metapodials grizzled brown; hind feet white, slightly darkened down the middle, ankles brown. Tail apparently dark throughout except at the base beneath. Ears large, 23 mm. broad.

Skull like that of *ferreocanus*, the ante-orbital plate with the lower edge vertical; but the nasals not extending so far behind the premaxillaries, posterior edge of frontals more curved, bullae larger, palatal foramina slightly smaller, falling short of the molars by nearly 2 mm., and the tooth-rows markedly diverging posteriorly.

Rattus mackenziae feae (Thomas),* though from an adjacent locality (Thagata, Muleyit Range, Tenasserim) and of nearly the same size, cannot be the same as this animal, for its colour is indicated as being "nearly deep purplish grey but browner," while this shows no tone of grey at all but is of a warm brown colour. Mr. Gairdner refers to it in his notes as the "chestnut-cheeked rat."

(For measurements see table *postea*).

The third specimen, though from the same place and of the general colour as the last, is smaller, yet the teeth indicate that it is of about the same age. I know of no form to which it seems allied and therefore describe it as

3. *Rattus kennethi*, sp. nov.

Type. Adult female from Sikawtur, 40 miles N. W. of Raheng, W. Siam, 1500 ft. [No. 2636/CBK.]. Collected by Mr. Kenneth G. Gairdner on 14 March 1917. Orig. No. 403.

Like *R. b. lactiventer* but smaller and without the warmer colouring on the sides, etc.; feet of more clearly defined dark and white pattern, tail pale below with a distinct pale tip. Skull more rounded and relatively broader, palatal foramina reaching the line of the molars, toothrows diverging rather less posteriorly.

* Journ. Bombay Nat. Hist. Soc. XXIV, p. 412 (1916).

Pelage composed of soft under fur and longer stiffer hairs, or spines not visibly flattened.

Colour above glossy Natal brown slightly grizzled by the buffy tips of the under-fur; sides of head, neck, body and the limbs paler, duller and rather more grizzled: base of under fur neutral grey, of the longer stiffer hairs whitish. Below white throughout. Foredigits whitish, metapodials brown. Feet white, the median line of the metapodials clearly defined brown; ankles brown. Tail dark above, pale beneath where the hair clothing it is pale: the terminal 15 mm. pale all round.

Skull with broader ante-orbital foramina than in *R. b. lactiventer*, the front edge of the plate slightly convex and overhanging the base; palatal foramina longer and pointed posteriorly, bullae relatively rather smaller.

Measurements of Siamese White-toothed Rats in millimetres.

				<i>R. bermorei</i> <i>muldus</i> ♀	<i>R. bowersi</i> <i>lactiventer</i> ♂	<i>R. kennethi</i> ♀
Head and body	...	...	...	180	235	215
Tail	...	...	...	152	255	242
Hindfoot s. u.	...	...	...	37.5	50.5	46
Ear	...	...	...	24	28.5	26
Skull:—						
greatest length	...	...	...	40.3	53	45.5
condylo-basilar length	...	...	...	38 *	47.4	42
palatilar length	...	...	...	20	25.2	22.2
diastema	...	...	...	13	16.5	14
upper molar row (alveoli)	...	...	...	7.2	9.1	8.8
combined palatal foramina	...	...	...	7 × 2.4	8.3 × 3.2	8.9 × 3
m ³ -m ³ (alveoli)	...	...	...	3.4	5	4.2
nasals	...	...	...	14.7* × 4.6	22 × 6.8	18.3 × 5.1
interorbital breadth	...	...	...	6.3	7.7	6.9
brain case breadth	...	...	...	17	19.7	18.2
zygomatic breadth	...	...	...	21.6	26.1	23.4

* Approximate

THE NIDIFICATION OF CERTAIN TERNS.

BY W. J. F. WILLIAMSON, F. Z. S., M. B. O. U.

I recorded in Vol. II of this Journal (p. 63) that I had obtained the eggs of *Sterna bergii* (the Large Crested Tern), *S. melanauchen* (the Black-naped Tern), and *S. anæsthesia* (the Panayan Tern) on some islets in the Inner Gulf of Siam in June and July 1916. Nearly all of these, however, were procured by my collector in the first-named month, and he kept no record of the number of eggs in each clutch. By the time I was able to visit the locality, in the middle of July, the laying season was over, and only a few addled eggs and some chicks remained, so I was not in a position to repair the deficiency.

During 1917 and 1918, I made a point of visiting these islets again, as well as some others, and it may be of interest to record the results. The dates of my visit were:—2nd June, in the former year, and 9th May, in the latter.

STERNA BERGII (subsp.?). The Large Crested Tern.

In 1917 I obtained 9 eggs of *S. bergii*, laid singly on the bare shingle of a beach at one end of a small islet, near Koh Rin—not the slightest attempt having been made by the birds to scrape out any sort of a depression or hollow to receive the eggs. In this respect my experience agrees with that of Colonel Butler, quoted in Hume's "Nests and Eggs of Indian Birds" (2nd Edition, Oates (1890), p. 297). Despite their large size, and the promiscuous way in which they were laid, these eggs required to be carefully looked for, as their colouration and markings (varying from a dead to a creamy white, with spots, blotches and streaks of reddish brown to dark brown) exactly matched those of the white streaky pebbles on which they were laid. As a consequence of this, one or two eggs were, unfortunately, trodden on inadvertently. All those obtained were perfectly fresh.

In 1918 I collected 23 single eggs and 2 pairs on a perfectly bare, low-lying rock near Koh Chuan, some little distance further south than Koh Rin. I have already alluded to this islet (*antea*, p. 38), in connection with the record of *Anous stolidus* (the Noddy) from Siam.

The ground-colour of a number of the eggs taken in 1918 was a very pale greenish blue; but this tint fades gradually to a dead white.

There appears to be no very definite information available as to the usual complement of eggs laid by the eastern form of *S. bergii*, and the only notes on the subject, which I have been able to trace, are all very old ones. Butler (*op. cit. supra*), in describing his personal visit to Astolah Island, off the Mekran coast, Baluchistan, on 29th May 1877, states that he obtained 93 eggs in one day, all laid singly. On the other hand, a large batch collected for him about three weeks later, by (apparently) a native of the locality, were said by the man to have been "usually three in each nest."! This statement is quoted by Hume without comment, but it cannot, I think, be given any credence. It is true that Butler, in speaking of his own find, says that the number of eggs was "at that time only one.....to each pair of birds"—thus implying that, at a later date, the number of eggs might have been increased, but apparently he himself never found more than one. On the other hand, it is to be noted that Captain Shopland (also quoted by Hume), who took eggs near Akyab, states that some of them were in pairs, though he does not give any figures.

My observations would seem to show that Siamese birds usually lay a single egg, but that occasionally there are two in a clutch.

STERNA MELANAUCHEN. The Black-naped Tern.

As regards *S. melanauchen*, I obtained 37 single eggs and 26 pairs in 1917—all of them quite fresh. About a week later, I had 4 single eggs and 3 pairs sent to me by a reliable European friend from a small islet near Koh-Si-Chang (in the same neighbourhood), all of which were more or less incubated. The number procured on the second occasion is somewhat small, but the proportion of double eggs to single ones is almost exactly the same as that of the very much larger number obtained by me, *viz.*, about 41 or 42 per cent. of the total assignable to each pair of birds. In 1918 I obtained very few eggs of this species, which appears to lay somewhat later than *S. bergii* and *S. anaetheta*—the actual number collected being 3 singles and 5 pairs. Osmaston [Journ. Bombay N. H. S., XVII (1906), p. 491] in writing of Andaman birds, observes that they lay "one or two eggs." This remark appears to be correct, as far as it goes. In Siam, I should say, about half the clutches contain two eggs, and the remainder one only.

STERNA ANÆSTHETA. The Panayan Tern.

The most numerous of the three species of tern which breed on the islets in the Inner Gulf of Siam is *S. anæsthetæ*, of the eggs of which I procured 89 single specimens and 1 pair in 1917—several of the former being in an advanced state of incubation. In 1918 the men with me collected several scores of eggs—all of which were singles, with the exception, again, of 1 pair. I kept the latter, and a selection of 24 of the single specimens. Butler, quoted by Hume (*op. cit.*, p. 300) says, with regard to one lot of eggs of this bird taken for him by some fishermen in the Persian Gulf, in June 1878, that the nests contained “from two to four eggs each.”! Later he remarks, in connection with a second set of eggs obtained in the following month, that there was “seldom more than one egg in a nest, sometimes two but never more,” while in a subsequent note he observes, “lays but one single egg.” Hume makes no comment on these contradictory statements, and there is nothing to show whether either of the last two was based on Butler’s personal observations or not. Judging from my own experience, it would appear that (at all events so far as Siam is concerned) a single egg is the usual complement, while a pair is laid only very occasionally.

As regards the ground-colour of the eggs, Hume remarks (p. 301), that it seems “to vary from nearly pure white to a rich pinky stone-colour.” A number of my eggs are of a pale bluish tint, and two of them are entirely unmarked with the usual specks, spots and blotches of reddish brown or burnt sienna brown, with underlying paler markings. The ground-colour of the great majority of the eggs in my collection varies, however, from a pale stone-colour to almost a café-au-lait tint.

ON A COLLECTION OF BIRDS FROM THE PROVINCE OF
PUKET, PENINSULAR SIAM.

BY H. C. ROBINSON AND C. BODEN KLOSS.

WITH A MAP.

The district in which this collection was made is fairly well known ornithologically, but the only paper actually dealing with the area is that of August Müller, "Die Ornithologie der Insel Salanga", 1882, pp. 1—96: Naumburg a Saale, originally published as a doctoral dissertation and apparently reprinted in the "Journal für Ornithologie," 1882.

Large collections were made in the district by J. Darling on behalf of A. O. Hume, which were the subject of scattered notices in "Stray Feathers," and which are now incorporated in the British Museum, while the island of Salanga was also visited by Ernst Hartert who has made a few remarks on its Fauna (Nov. Zool., IX, pp. 222—226).

In the present paper three more subspecies are diagnosed, viz:—

<i>Cyanops mystacophanes aurantiifrons</i>	} nobis,
<i>Mesobucco duvauceli stuarti</i>	
<i>Chloropsis cyanopogon septentrionalis</i>	

while two species,

Pericrocotus roseus (Vieill.),

Pericrocotus cantonensis (Swinh.),

are recorded for the first time from the Malay Peninsula, though the latter had been collected in Trang as far back as 1910.

The collections were made by native collectors without European superintendence; and details of soft parts, which men of this type cannot note with sufficient accuracy to be worth recording, are therefore lacking.

The localities visited will not be found in any ordinary map and can only be traced in the Admiralty Chart No. 2492 and the publications of the Siamese Survey Office, and we have therefore supplied an outline map on which the route of our party is marked.

The collection was made between December 20th and February 18th, and therefore comprises a considerable number of seasonal visitors which would not be found later in the year. The occurrence of the comparatively rare Cuckoo Falcon, *Baza loyphotes*, in large numbers is

noteworthy, as is also the capture of the rare Rock Thrush, *Monticola gularis*.

Special acknowledgements are due to the kindness of Mr. David Heddle of Tongkah, who took charge of our collectors and made arrangements for their visits to the surrounding country and to whose efforts their success is very largely due. We are also indebted to the courtesy of the Siamese Government, who granted our men permits to shoot and admitted all our collecting material and other impedimenta free of duty.

Thanks are also due to Mr. W. J. F. Williamson for making the necessary arrangements on our behalf with the central Government at Bangkok, and to Mr. J. Bailey, H. B. M. Vice-Consul at Tongkah, for general assistance in that island. The following are the localities visited :—

1. Nong Kok, Ghirbi or Krabi, Peninsular Siam.

Some seven or eight miles from the Ghirbi, or Krabi, river, in open park-like land with patches of jungle backed with precipitous limestone hills. A very rich collecting ground.

[In Puket or Junk Sèylon Island—also known as Salanga or Tongkah Island] :—

2. Klong Tung Sai. A low, forested range of hills in the south central part of the island.

3. Telok Palas. A large village on the east coast.

[In the Bay between Junk Seylon Island and the mainland :—

4. Pulau Sireh. An island off the east coast of Junk Seylon Id. near Tongkah Harbour, separated by a narrow and very shallow strait from the main island.

5. Koh Maprau } Small islands with small jungle to the

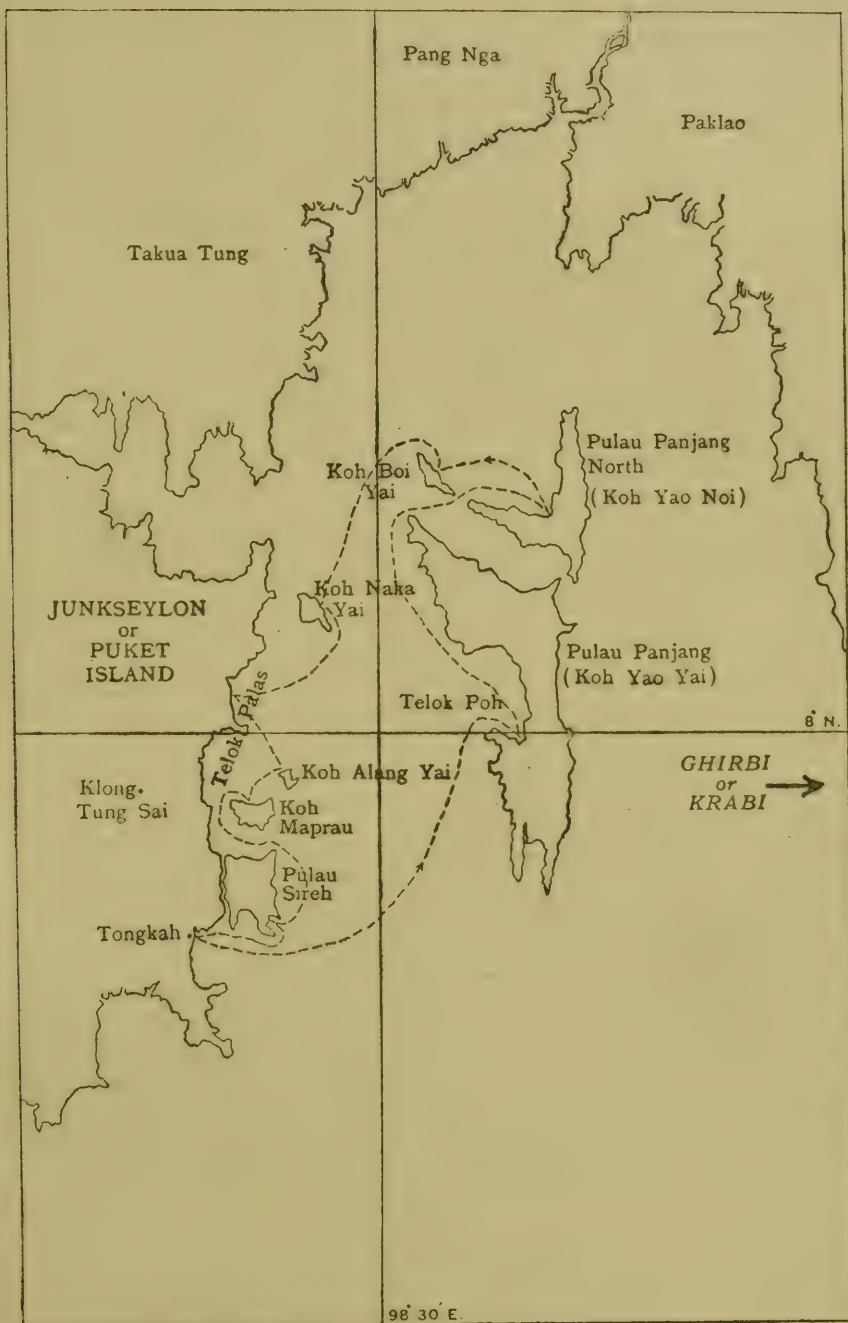
6. Koh Alang Yai } north of Pulau Sireh.

7. Telok Poh, Pulau Panjang (Koh Yao Yai). A village on the west side of the largest island in the Bay between Junk Seylon and the mainland.

8. Pulau Panjang North (Koh Yao Noi). An island to the north of Pulau Panjang, separated from it by a narrow shallow strait.

9. Koh Boi Yai. A small island near the western extremity of Pulau Panjang North.

10. Koh Naka Yai. A small island between the northern parts of Junk Seylon and Pulau Panjang.



MAP OF PUKET ISLAND.

Müller's paper, referred to above, is quoted as "Müller," and a report entitled "On a collection of birds from the island of Langkawi and other Islands on the North-West Coast of the Malay Peninsula," by Herbert C. Robinson [Journ. Fed. Malay States Mus. VII, pp. 129—191 (1917)] is quoted as "Robinson".

1. *LOPHURA RUFA* (Raffles).

Ogilvie Grant, Cat. Birds Brit. Mus, XXII, p. 287 (1893).

♂. Nong Kok, Ghirbi, Peninsular Siam.

W. 268 mm.

2. *GALLUS GALLUS* (Linn.).

Müller, p. 80; Kloss, Ibis 1918, p. 81.

2 ♂. Telok Palas, Junk Selyon. 6—7 February 1918.

W. 220, 227 mm.

3. *PAVO CRISTATUS* Linn.

3 ♂. Nong Kok, Ghirbi, Peninsular Siam. 4—8 January 1918.

W. 460, 482, 477 mm.

Two specimens are in full plumage, while one, though adult, has not yet acquired the "train."

4. *TURNIX PUGNAX PLUMBIPES* (Hodgs.).

Stuart Baker, Journ. Bombay Nat. Hist. Soc. XXIII, p. 395 (1915).

Turnix plumbeipes, Müller, p. 81.

♀ imm. Nong Kok, Ghirbi, Peninsular Siam. 11 January 1918.

♀ ad. Telok Poh, Pulau Panjang. 22 January 1918.

W. (ad), 88 mm.

5. *OSMOTRERON BICINCTA DOMVILLII* Swinh.

Robinson, Ibis 1915, p. 723.

♀. Nong Kok, Ghirbi, Peninsular Siam. 10 January 1918.

2♀. Islet near Pulau Panjang. 28, 29 January 1918.

W. ♂, 157 mm.; ♀, 157, 163.

In the Malay Peninsula this green pigeon is rare and sporadic south of Trang, and has not been met with at all south of Kuala Selangor.

6. *OSMOTRERON VERNANS* (Linn.).

Robinson, p. 135.

Osmotreron viridis, Müller, p. 78.

♂, 4 ♀. Nong Kok, Ghirbi, Peninsular Siam. 5—12 January 1918.

3 ♂, ♀. Telok Poh, Pulau Panjang. 19—26 January 1918.

♂, 2 ♀. Islet near Pulau Panjang. 29, 30 January 1918.

W. ♂, 142, 148, 150, 146, 147 mm. ♀, 147, 140, 141, 136, 139, 141, 143.

7. *TRERON CURVIROSTRA NIPALENSIS* (Hodgs.).

Robinson, p. 135.

♂ vix ad. Klong Tung Sai, Junk Seylon. 19, 20 December 1918.

W. 139, 133 mm.

8. *CARPOPHAGA ÆNEA ÆNEA* (Linn.).

Robinson, p. 136; Kloss, Ibis 1918, p. 33.

♀. Telok Poh, Pulau Panjang. 25 January 1918.

W. 222 mm.

9. *COLUMBA PUNICEA* (Tick.).

Robinson, p. 136.

♂. Telok Palas, Junk Seylon. 7 February 1918.

W. 214 mm.

10. *STREPTOPELIA SURATENSIS TIGRINA* (Temm.).

Robinson, p. 137.

Turtur tigrinus, Müller, p. 132.

♀. Klong Tung Sai, Junk Seylon. 26 December 1917.

W. 143 mm.

11. *GEOPELIA STRIATA* (Linn.).

Robinson, p. 137; Müller, p. 79.

♀. Nong Kok, Ghirbi, Peninsular Siam. 3 January 1918.

W. 98 mm.

12. *CHALCOPHAPS INDICA* (Linn.).

Robinson, p. 137.

♂, 2 ♀. Nong Kok, Ghirbi, Peninsular Siam. 3—6 January 1918.

♀. Koh Alang Yai. 8 February 1918.

♀. Koh Maprau. 10 February 1918.

W. ♂, 149 mm.; ♀, 144, 143, 138, 144.

13. *RALLINA FASCIATA* (Raffles).

Robinson, p. 137.

♀ sex ad. Pulau Sireh, east side of Junk Seylon. 13 February 1918.

W. 143 mm.

14. *AMAUORNIS PHOENICURA CHINENSIS* (Bodd.).

Robinson, p. 138.

Erythra phoenicura, Müller, p. 86.

♂. Telok Poh, Pulau Panjang. 21 January 1918.

♀. Islet near Pulau Panjang. 31 January 1918.

W. ♂, 173 mm.; ♀, 157.

15. *SARCOGRAMMUS INDICA ATRINUCHALIS* Jerd.

Robinson, p. 138; Kloss, Ibis 1918, p. 85.

Lobivanellus atrinuchalis, Müller, p. 82.

♂. Nong Kok, Ghirbi, Peninsular Siam. 8 January 1918.

♂. Telok Poh, Pulau Panjang. 20 January 1918.

W. 214, 222 mm.

16. *TRINGOIDES HYPOLEUCUS* (Linn.).

Robinson, p. 140; Müller, p. 83.

♀. Nong Kok, Ghirbi, Peninsular Siam. 8 January 1918.

♂. Telok Poh, Pulau Panjang. 21 January 1918.

W. ♂, 107 mm. ♀, 103.

17. *GALLINAGO STENURA* (Bp.)

Robinson, p. 141.

♀. Telok Poh, Pulau Panjang. 24 January 1918.

♀. Islet near Pulau Panjang. 31 January 1918.

W. 128, 127 mm.

18. *PSEUDOTANTALUS LEUCOCEPHALUS* (Penn.).

Robinson, Journ. Fed. Malay States Mus. V, p. 88 (1913).

♀. imm. Nong Kok, Ghirbi, Peninsular Siam. 4 January 1918.

W. 455 mm.

Wing coverts dull brown, tertiaries rosy pink.

19. *DISSOURA EPISCOPUS* (Bodd.).

Müller, p. 85.

♀. Nong Kok, Ghirbi, Peninsular Siam. 31 December 1918.

W. 490 mm.

20. *LEPTOPTILUS JAVANICUS* (Horsf.).

Leptoptilus dubius, Robinson & Kloss, Ibis 1911, p. 16.

♂. Koh Naka Yai. 4 February 1918.

W. 620 mm.

The specimen recorded by us as *L. dubius* (loc. cit. supra) turns out, on re-examination, to be a large male of *L. javanicus* in breeding plumage. It has a coppery bronze subterminal band to the secondary coverts and no black tips to the under tail-coverts.

21. *GRAPTOCEPHALUS DAVISONI* (Hume).

Robinson, p. 141.

Pseudibis papiblonia, Müller, p. 85.

♀. Nong Kok, Ghirbi, Peninsular Siam. 31 December 1918.

2 ♀. Koh Naka Yai. 4 February 1918.

W. 395, 400, 390 mm.

22. *DEMIEGRETTA SACRA* (Gm.).

Robinson & Kloss, Ibis 1911, p. 15.

♂ ♀ Telok Poh, Pulau Panjang. 21 January 1918.

♂ Koh Boi Yai. 2 February 1918.

W. ♂. 280, 275; ♀ 260 mm.

All three birds are in the grey phase and in breeding plumage.

23. *BUTORIDES JAVANICA* (Horsf.).

Robinson & Kloss, Ibis 1911, p. 15; Müller, p. 84.

♂, ♀. Telok Poh, Pulau Panjang. 21—26 January 1918.

W. ♂ 175; ♀ 167 mm.

24. *ARDEOLA GRAYI* (SYKES).

1 ♀. Telok Poh, Pulau Panjang. 19—25 January 1918.

W. ♂. 220; ♀ 206 mm.

These birds are in winter plumage and cannot be identified with any great certainty. They are, however, rather small for *A. bacchus* (Bp.), which occurs in the same district.

25. *ASARCORNIS SCUTULATA* LEUCOPTERA (Blyth).

Robinson & Kloss, Ibis 1911, p. 20.

4 ♂. Nong Kok, Ghirbi, Peninsular Siam. 1—9 January 1918.

W. 372, 364, 355, 354 mm.

All the four birds have the knob on the angle of the wing well pronounced. One, apparently very adult, is entirely black beneath; the three others rusty brown with a more or less pronounced black pectoral collar.

26. *DENDROCYCNA JAVANICA* (Horsf.).

Robinson & Kloss, Ibis 1911, p. 21.

2 ♂, 2 ♀. ad., 2 ♀. imm. Nong Kok, Ghirbi, Peninsular Siam.
1—3 January 1918.

W. ♂ 175. 155 (moult): ♀. 170, —, 175, 173 mm.

27. *LOPHOSPIZIAS TRIVIRGATUS* (Temm.).

♀ imm. Klong Tung Sai, Junk Seylon. 27 December 1918.

W. 240 mm.

Not a very common bird in the Malay Peninsula.

28. *ASTUR BADIUS POLIOPSIS* (Hume).

Robinson & Kloss, Ibis 1911, p. 22; Kloss, Ibis 1918, p. 87.

1 ♀ imm. Klong Tung Sai, Junk Seylon. 19 December 1918.

2 ♀ ad. 1 ♀ imm. Telok Poh, Pulau Panjang. 20—26 January 1918.

W. ♀ ad. 216. 211; ♀ imm. 216; 205 mm.

The adults are without any trace of a post-cervical rufous collar.

29. *SPIZAËTUS LIMNAËTUS* (Horsf.).

Robinson & Kloss, p. 23.

♂. Nong Kok, Ghirbi, Peninsular Siam. 8 January 1918.

♂. Koh Naka Yai. 4 February 1918.

W. 380, 383 mm.

30. *BUTASTUR INDICUS* (Gm.).

Robinson & Kloss, Ibis 1911, p. 23

♀. Nong Kok, Ghirbi, Peninsular Siam. 1 January 1918.

W. 330. mm.

Rare in the Peninsula, the only definite records being a specimen from Singapore Id. and two from Langkawi.

31. *HALIASTUR INDUS INTERMEDIUS* Gurney.

Haliastur indus, Müller, p. 76.

♀. Nong Kok, Ghirbi, Peninsular Siam. 8 January 1918.
W. 407 mm.

32. *BAZA LOPIHOTES* (Temm.).

Robinson & Kloss, Ibis 1911, p. 25; Kloss, Ibis 1918, p. 88;
Müller, p. 125.

♂ ♂, 4 ♀. Nong Kok, Ghirbi, Peninsular Siam. 2—10 January 1918.

2 ♀. Klong Tung Sai, Junk Seylon. 26 December 1918.

1 ♀. Telok Poh, Pulau Panjang. 23 January 1918.

1 ♂. Islet off Pulau Panjang. 29 January 1918.

W. ♂. 236, 232, 236, 236; ♀. 243, 240, 231, 234, 224, 238;
236 mm.

All fully adult birds, probably on migration.

33. *POLIOÆTUS ICITHYÆTUS* (Horsf.).

Robinson & Kloss, Ibis 1911, p. 30.

♀. Koh Alang Yai. 9 February 1918.

♂ imm. Nong Kok, Ghirbi, Peninsular Siam. 2 January 1918.

W. ♀ ad. 462; ♂ imm. 470 mm.

34. *KETUPA KETUPA* (Horsf.).

Ketupa javanensis, Robinson & Kloss, Ibis 1911, p. 30.

♂. ♀. Telok Poh, Pulau Panjang. 19 January 1918.

♀. Koh Alang Yai. 9 February 1918.

W. ♂. 330; ♀ 338, 341 mm.

35. *OTUS SCOPS MALAYANA* (Hay).

Robinson, p. 145.

♂. Telok Palas, Junk Seylon. 6 February 1918.

W. 143 mm.

A very pale grey bird.

36. *NINOX SCUTULATA MALACCENSIS* (Eyton).

Robinson, p. 145; Kloss, Ibis 1918, p. 89.

♀. Klong Tung Sai, Junk Seylon. 31 December 1918.

W. 199 mm.

Apparently belongs to the darker, smaller resident form.

37. *SYRNIO SELOPUTO* (Horsf.).

Robinson & Kloss, Ibis 1911, p. 31.

♂. Koh Boi Yai. 2 February 1918.

W. 342 mm.

38. *EURYSTOMUS ORIENTALIS ORIENTALIS* (Linn.).

Robinson, p. 151.

3 ♀. Nong Kok, Ghirbi, Peninsular Siam. 2—7 January 1918.

W. 177, 185, 185 mm.

39. *EURYSTOMUS ORIENTALIS CALONYX* Sharpe.

1 ♂, 1 ♀, 1? Nong Kok, Ghirbi, Peninsular Siam. 31 December—5 January 1918.

1 ♀. Klong Tung Sai, Junk Sylon. 26 December 1917.

1 ♀. Islet off Pulau Panjang. 21—29 January 1918.

W. ♂ 191; ♀ 199, 195, 186; sex? 196 mm.

Extremes of the two races of *E. orientalis* are readily separated, but there are many intermediate birds which it is hard to assign to either form.

40. *ALCEDO ISPIDA BENGALENSIS* Gm.

Robinson p. 146.

Alcedo bengalensis, Müller, p. 44.

1 ♂. Klong Tung Sai, Junk Sylon. 26 December 1918.

1 ♂, 1 ♀. Telok Poh, Pulau Panjang. 19—26 January 1918.

1 ♀. Koh Alang Yai. 8 February 1918.

W. ♂. 73, 69 ♀. 70, 71 mm.

41. *ALCEDO MENINTING* Horsf.

Müller, p. 45; Robinson, p. 146.

♂. Klong Tung Sai, Junk Sylon. 21 December 1918.

W. 62 mm.

42. *HALCYON SMYRNENSIS FUSCA* (Bodd.).

Robinson, Ibis 1915, p. 732.

1 ♂, 2 ♀. Nong Kok, Ghirbi, Peninsular Siam. 1—7 January 1918.

1 ♂. Telok Poh, Pulau Panjang. 24 January 1918.

3 ♂, 2 ♀. Islet off Pulau Panjang. 28—31 January 1918.

W. ♂ 118, 116, 115, 117, 120; ♀ 122, 121, 118, 117 mm.

43. *HALCYON PILEATA* (Bodd.).

Robinson, p. 148.

Entomobia pileata, Müller, p. 46.

1 ♀ Telok Palas, Junk Seylon. 7 February 1918.

1 ♂ Koh Maprau. 10 February 1918.

W. ♂ 129, ♀ 138 mm.

44. HALCYON CHLORIS (Bodd.).

Robinson, p. 149.

Sauropatis chloris, Müller, p. 46.

1 ♂, 2 ♀. Telok Poh, Pulau Panjang, 19—26 January 1918.

W. ♂ 99 ♀ 105.97 mm.

45. DICHOCEROS BICORNIS (Linn.).

Robinson, p. 150; Müller, p. 50.

♂, ♀. Nong Kok, Ghirbi, Peninsular Siam. 3—7 January

1918.

2 ♂. Klong Tung Sai, Junk Seylon. 20 December 1917.

W. ♂ 480, 480, 477 : ♀. 440. mm.

46. ANTHRACOCEROS ALBIROSTRIS (Shaw & Nodder).

Robinson, p. 150.

Hydrocissa albirostris, Müller, p. 47.

♀. Nong Kok, Ghirbi, Peninsular Siam. 2 January 1918.

W. 252 mm.

47. RHYTIDOCEROS UNDULATUS (Shaw).

Robinson, p. 150; Müller, p. 48.

♂ ♀. Klong Tung Sai, Junk Seylon. 18—20 December 1917.

W. ♂ 472; ♀ 407 mm.

48. UPUPA EPOPS LONGIROSTRIS Jerd.

Kloss, Ibis 1918, p. 92.

Upupa longirostris, Müller, p. 43.

♂ Telok Poh, Pulau Panjang. 24 January 1918.

7 ♂, 2 ♀. Islet near Pulau Panjang. 28—31 January 1918.

Pulan Sireh, east side, Junk Seylon. 13 February 1918.

W. ♂. 150, 141, 137, 135, 135, 138, 139, 142, 137. ♀ 135, 134 mm.

There seems much variation in size in the Hoopoes obtained in Siam and the Malay Peninsula, but as the birds are largely migrant it is possible that the different sized birds have different breeding ranges.

49. MELITTOPHAGUS LESCHENAUTI SWINHOEI Hume.

Robinson, p. 152.

Merops quinticolor, Müller, p. 44.

1 ♀ Nong Kok, Ghirbi, Peninsular Siam. 11 January 1918.
 4 ♂, 5 ♀ Klong Tung Sai, Junk Seylon. 19—27 December 1917.

2 ♂, 1 ♀. Telok Poh, Pulau Panjang. 19—24 January 1918.
 W. ♂ 104, 104, 108, 108, 105, 105; ♀ 107, 106, 109, 105, 106,
 103, 102 mm.

50. NYCTIORNIS AMICTA (Temm.).

♂ Nong Kok, Ghirbi, Peninsular Siam. 9 January 1918.
 W. 128 mm.

51. LYNCORNIS CERVINICEPS (Gould).

.Robinson, Ibis 1915, p. 735; Robinson & Kloss, Ibis 1911, p. 38.

2♂, ♀ Klong Tung Sai, Junk Seylon. 21 December 1917.
 W. ♂ 296 ♀ 292. mm.

52. CAPRIMULGUS MACRURUS AMBIGUUS Hartert.

Caprimulgus macrurus bimaculatus, Robinson, p. 153.

Caprimulgus macrurus ambiguus, Kloss, Ibis 1918, p. 94.

Caprimulgus macrurus, Müller, p. 51.

♂. Klong Tung Sai, Junk Seylon. 24 December 1917.

♀. Pulau Sireh. 14 February 1918.

W. ♂ 201; ♀ 190 mm.

Not materially different, either in size or tint, from birds from Selangor and the vicinity of Malacca.

53. PYROTROGON ORESKIOS UNIFORMIS Robinson.

Robinson, p. 149.

Pyrotrogon oreskios, Kloss, Ibis 1918, p. 97.

Orescius gouldi (Swains.).

2 ♀ Klong Tung Sai, Junk Seylon. 21—27 December 1917.

W. 120, 121 mm.

54. SURNICULUS LUGUBRIS DICRUROIDES (Hodgs.).

Robinson, p. 156; Kloss, Ibis 1918, p. 97.

Cacangelus lugubris (Horsf.), Müller, p. 52.

1 ♂, 5 ♀. Nong Kok, Ghirbi, Peninsular Siam. 1—4 January 1918.

3 ♂, 1 ♀, 3? Klong Tung Sai, Junk Seylon. 20—24 December 1917.

1 ♀. Islet off Pulau Panjang. 31 January 1918.

W. ♂ 132, 139, 137, 137; ♀ 137, 136, 137, 135, 136, 134, 135; sex? 142, 135, 135 mm.

55. *HIEROCOCCYX SPARVERIOIDES* (Vig.).

Robinson, p. 159

♂ Nong Kok, Ghirbi, Peninsular Siam. 3 January 1918.

♂ Islet off Pulau Panjang. 30 January 1918.

W. 227, 232 mm.

56. *PENTHOCERYX SONNERATI PRAVATA* (Horsf.).

Robinson & Kloss, Journ. F.M.S. Mus., VIII, Pt ii, p. 135 (1918).

Penthoceryx sonnerati, Müller, p. 52.

Nong Kok, Ghirbi, Peninsular Siam. 6 January 1918.

W. 110 mm.

57. *CACOMANTIS MERULINUS QUERULUS* Heine.

Cacomantis querulus, Heine, J. f. O., 1863, p. 352.

Cacomantis threnodes, Müller, p. 53.

Cacomantis merulinus querulus, Kloss, Ibis 1918, p. 98.

2 ♂ ad.; 1 ♂ vix ad. Nong Kok, Ghirbi, Peninsular Siam
4—9 January 1918.

1 ♂, 1 ♀ imm. Telok Poh, Pulau Panjang. 25, 26 January
1918.

W. ♂ 106, 109, 102 (vix ad.), 106; ♀ 105.

Rather smaller on the average than the true *C. m. querulus* from Tenasserim, but larger than typical *C. m. merulinus* from Java and with a darker belly; larger than *C. m. threnodes* Heine, from Malacca.

58. *CHALCOCOCCYX MACULATUS* (Gm.).

Robinson & Kloss, Ibis 1911, p. 41.

1 ♀. Nong Kok, Ghirbi, Peninsular Siam. 6, 7 January 1918.

W. ♂ 108; ♀ 107 mm.

A very rare bird throughout the Peninsula, but commoner in the north.

59. *EUDYNAMIS ORIENTALIS MALAYANA* Cab. & Heine.

Robinson, p. 160; Kloss, Ibis 1918, p. 99

Eudynamis malayanus, Müller, p. 54.

3 ♂, 1 ♀. Islet off Pulau Panjang. 28—30 January 1918.

2 ♂. Koh Naka Yai. 4 February 1918.

1 ♀. Pulau Sirih, east coast, Junk Seylon. 14 February
1918.

2 ♀. Koh Alang Yai. 8 February 1918.

W. ♂. 203, 203, 193, 196, 205: ♀. 186, 200, 201, 197 mm.

We have placed all this series under *E. o. malayana*, though two females from Pulau Panjang and Koh Alang Yai appear to agree with *E. o. honorata* (Linn.). The size of the whole series is on the maximum limit of *E. o. honorata* and the minimum of *E. o. malayana*, and we are not convinced that the continental birds are really separable.

60. CENTROPUS SINENSIS INTERMEDIUS (Hume).

Robinson, p. 157.

Centrococcyx rufipennis (Ill.), Müller, p. 59.

♂ Nong Kok, Ghirbi, Peninsular Siam. 3 January 1918.

2 ♀ Klong Tung Sai, Junk Sylon. 20—23 December 1917.

♀ Telok Poh, Pulau Panjang. 23 January 1918.

♀ Islet off Pulau Panjang. 28 January 1918.

W. ♂ 203; ♀ 200, 204, 215, 204 mm.

61. RHOPODYTES DIARDI (Less.).

Robinson & Kloss, Ibis 1911, p. 42.

♀ Nong Kok, Ghirbi, Peninsular Siam. 10 January 1918.

W. 128 mm.

62. RHOPODYTES SUMATRANUS (Raffles).

Robinson, p. 158; Müller, p. 57.

♀ Nong Kok, Ghirbi, Peninsular Siam. 10 January 1918.

W. 135 mm.

63. UROCOCCYX ERYTHROGNATHUS (Hartl.).

Robinson & Kloss, Ibis 1911, p. 43.

Rhamphococcyx erythrognaethus, Müller, p. 57.

2 ♂, 2 ♀. Nong Kok, Ghirbi, Peninsular Siam. 4—8 January 1918.

2 ♀. Klong Tung Sai, Junk Sylon. 24—26 December 1917.

W. ♂, 175, 177; ♀. 174, 165, 175, 165 mm.

64. CALORHAMPHUS HAYI (J. E. Gray).

Robinson, p. 165.

♀ Klong Tung Sai, Junk Sylon. 20 December 1917.

W. 85 mm.

Almost at the northern limit of its range.

65. *CYANOPS MYSTACOPHANES AURANTIFRONS*, subsp. nov.

Megalæma mystacophanes, Müller, p. 75.

Differs from all other forms of the species in having the forehead orange, merging more gradually into the crimson of the occiput, not clear bright yellow sharply defined therefrom.

Type. Adult male. Nong Kok, Ghirbi, Peninsular Siam. 3 January 1918.

Wing, 99; tail, 56; tarsus, 27; bill from gape, 42 mm.

Specimens examined:—

2 ♂ Nong Kok, Ghirbi, Peninsular Siam. 3—5 January 1918.

♂, ♂ imm. Pulau Sireh, near Junk Seylon. 14 February 1918.

W. 99, 99, 99, 92 (imm.).

We have compared with this series a male from the Bencoolen district of Sumatra (typical of the species), 3 males (1 imm.) from Sarawak, typical of *C. m. humii* Marshall, which is very doubtfully distinct, and 11 adults from various parts of the Malay Peninsula, which also agree with the Sumatran birds but have been named *C. quadricolor* (Eyton, P. Z. S. 1839, p. 105; On Malaccan birds). Müller (loc. cit. supra) has already noted the differences cited above.

✓ 66. *MESOBUCCO DUVAUCELLI STUARTI*, subsp. nov.

Xantholæma Duvacelli, Müller, p. 75.

A form allied to *M. d. cyanotis* and, like it, with blue ear-coverts and a poorly developed black pectoral patch and pale red subocular spot intermixed with yellow; but post-auricular and post-malar spots deep red and the size noticeably smaller.

Type. Adult male. Collected at Klong Tung Sai, Junk Seylon on 22 December, 1917.

W. 78, 75,* 73; Tail, 49, 49,* 49; Bill from gape, 24.5, 25.0,* 24.5 mm.

This is the bird which we have hitherto regarded as typical *M. d. cyanotis* (Blyth), which is not the case. *Mesobucco duvauceli orientalis*† Robinson, a larger bird with yet paler red areas on the head, is possibly synonymous with the true *M. d. cyanotis*, a point

* Type.

† Ibis 1915, p. 738.

which can be only decided by examination of the types or other specimens from Arakan.

Range. As at present known, Bandon to Trang.

Specimens examined. Nine (wings, 73—79). Wing, *M. d. orientalis*, 83—84 mm.

67. XANTHOLEMA HÆMACEPHALA (P. L. S. Müll.).

Robinson, p. 165, Müller, p. 75.

2 ♂, 4 ♀ Telok Poh, Pulau Panjang. 21—26 January 1918.

1 ♂ Islet near Pulau Panjang. 29 January 1918.

W ♂ 84, 78, 84 mm. ♀ 79, 78, 76 (worn), 76 mm.

68. GECINUS VIRIDANUS (Blyth).

Gecinus viridanus, Robinson, Journ. F. M. S. Mus., vii, p. 164;

Kloss, Ibis 1918, p. 104.

Gecinus weberi, Müller, p. 69.

2 ♀. Klong Tung Sai, Junk Seylon. 21—26 December 1917.

♂, ♀. Koh Maprau. 11 February 1918.

♂. Koh Boi Yai. 2 February 1918.

♂, ♀. Telok Poh, Pulau Panjang. 20—25 January 1918.

♂. Pulau Panjang North. 30 January 1918.

♂, ♀. Pulau Sireh. 13, 14 February 1918.

♂. Nong Kok, Ghirbi, Peninsular Siam. 1 January 1918.

W. ♂, 130, 138, 135, 129, 136, 135. ♀, 134, 136, 138, 136, 132.

Junk Seylon specimens were described as a distinct species by Müller under a misapprehension, as he compares them throughout with *G. striolatus* (Blyth) and *G. vittatus* (Vieill.), but does not mention the present form. The above series, and others from Pulau Lontar, Pulau Muntia and Pulau Telibun, agree with those from the mainland, though there is considerable variation in the limit of green above and below, some being much more bronzy than others.

69. GECINULUS VIRIDIS ROBINSONI Kloss.

Kloss, Ibis 1918, p. 105.

♀ Nong Kok, Ghirbi, Peninsular Siam. 2 January 1918.

W ♀ 127 mm.

The distinctions on which this race is founded are somewhat fine, but are still perceptible when a large series is examined.

70. IYNGIPICUS CANICAPILLUS Blyth.

Robinson & Kloss, Ibis 1911, p. 46

2 ♂, ♀. Telok Poh, Pulau Panjang. 21—24 January 1918.

♀. Islet off Pulau Panjang. 28 January 1918.

W. ♂. 83, 78; ♀ 84, 83, 81 mm.

71. *MICROPTERNUS BRACHYURUS* (Vieill.).

1 ♂, 1 ? Nong Kok, Ghirbi, Peninsular Siam. 31 December 1917.

W. 112, 117 mm.

72. *CALLLOLOPHUS MINIATUS MALACCENSIS* (Lath.).

Callolophus malaccensis, Müller, p. 68.

1 ♂, 1 ♀. Nong Kok, Ghirbi, Peninsular Siam. 10 January 1918.

1 ♀. Klong Tung Sai, Junk Seylon. 25 December 1917.

W. ♂ 127; ♀ 127, 127 mm.

Showing no approach to *C. m. perlutus* from Koh Lak, S. W. Siam (Kloss, Ibis 1918, p. 110).

73. *CHRYSOCOLAPTES GUTTACRISTATUS GUTTACRISTATUS* (Tickell).

Chrysocolaptes guttacristatus indo-malayicus, Robinson, p. 162.

Indopicus strictus, Müller, p. 61.

Chrysocolaptes guttacristatus guttacristatus, Kloss, Ibis 1918, p. 111.

2 ♂. Nong Kok, Ghirbi, Peninsular Siam. 10—12 January 1918.

1 ♂. Klong Tung Sai, Junk Seylon. 21 December 1917.

♀ Islet off Pulau Panjang. 9 January 1918.

♂ Koh Naka Yai. 5 February 1918.

W. ♂ 151, 155, 158, 153; ♀ 155 mm.

The specimen from Junk Seylon is an absolute topotype of *Chrysocolaptes guttacristatus indo-malayicus*, Hesse (Ornith. Monatsb., p. 182). We think however that the author has diagnosed his form by comparison with the large Himalyan and not with the typical central Indian race, and that any real differences therefore remain to be demonstrated.

74. *SASIA ABNORMIS EVERETTI* Hargitt.

Sasia abnormis, Robinson & Kloss, p. 48.

♀ Nong Kok, Ghirbi, Peninsular Siam. 10 January 1918.

W. 535 mm.

75. *CALYPTOMENA VIRIDIS* Raffles.

Muller, p. 41.

♀ Klong Tung Sai, Junk Seylon. 22 December 1917.

W. 107 mm.

76. *CORYDON SUMATRANUS* (Raffles).

Muller, p. 43.

2 ♀. Klong Tung Sai, Junk Seylon. 20—22 December 1917.

W. 136, 138.

77. *CYMBORHYNCHUS MACRORHYNCHUS MALACCENSIS* Salvad.

Muller, p. 42.

1 ♂, 3 ♀. Nong Kok, Ghirbi, Peninsular Siam. 2—12 January 1918.

W. ♂ 100 mm.; ♀ 97, 97, 94.

The male has a white spot on the 4th pair of tail feathers; one female has 3 pairs of tail feathers spotted, one has 4 pairs spotted and a spot on the inner web of the fifth pair.

78. *EUCICHLA GURNEYI* Hume.

Robinson & Kloss, Ibis 1911, p. 49.

Pitta gurneyi, Hume, Stray Feathers, III, p. 296, pl. III.

♂ Klong Tung Sai, Junk Seylon. 21 December 1917.

W. 102 mm.

Apparently not nearly so common on this island as on the mainland of Trang, further to the south.

79. *HIRUNDO BADIA* Cass.

Robinson, p. 166.

1 ♂, 2 ♀, Nong Kok, Ghirbi, Peninsular Siam. 2—5 January 1918.

W. 139; ♀ 138, 137 mm.

80. *HEMICHELIDON SIBIRICA FULIGINONA* (Hodgs.).

Hemichelidon fuliginona, Hodgs. P. Z. S. 1845, p. 32.

♀, 1 (?) imm. Klong Tung Sai, Junk Seylon. 18—27 December 1917.

W. 27; imm. (?) 70 mm.

The unsexed bird is very much darker above and below, with a smaller bill and rufous buff edgings to the wing coverts well marked:

it is probably younger than the other specimen. The species is rare in the Malay Peninsula. We have half a dozen specimens from Trang to Selangor shot in December, January or April.

81. *ALSEONAX LATIROSTRIS* (Raffles).

Robinson, p. 168 ; Müller, p. 11.

♂ Nong Kok, Ghirbi, Peninsular Siam. 2 January 1918.

♂, ♀, Klong Tung Sai, Junk Seylon. 26, 27 December 1917.

♂ Telok Poh, Pulau Panjang. 19 January 1918.

2 ♀ Islet near Pulau Panjang. 30, 31 January 1918.

W. ♂, 67, 68, 67 ; ♀ 66, 68, 68 mm.

82. *CYORNIS MAGNIROSTRIS* Blyth.

Robinson & Kloss, Ibis 1911, p. 51 (Trang).

[♀] ♂ imm. Nong Kok, Ghirbi, Peninsular Siam. 12 January 1918.

♂, ♀. Klong Tung Sai, Junk Seylon. 21 December 1917.

W. ♂ 78, 74 imm. 76 (imm. Trang) ; ♀ 75.

The specimen sexed [♀] by the collector (but almost certainly an immature male, as it has a few blue feathers on the forehead) precisely agrees with the immature males from Chong Hill, Trang, obtained by us in December 1910.

83. *MUSCITREA GRISOLA GRISOLA* (Blyth).

Robinson, p. 169.

♂ Telok Poh, Pulau Panjang. 20 January 1918.

W. 86 mm.

84. *GERYGONE MODIGLIANI PECTORALIS* Davison.

Gerygone pectoralis, Davison, Ibis 1892, p. 99.

Gerygone griseus, Gyldenstolpe, Ornith. Monatsb. p. 27 (1916) : id. Kungl. Sv. Akad. Handl., 56, No. 2, p. 78, Pl. 2, fig. 2 (1917).

♀ Islet near Pulau Panjang. 28 January 1918.

W. 48 mm.

We have dealt elsewhere with *Gerygone griseus*, founded on a single specimen from Kok Lak. The form appears quite inadmissible even as a subspecies, but it is futile to attempt to divide the species into local races based on single individuals.

85. *HYPOTHYMIS AZUREA PROPHATA* Oberholser.

Robinson, p. 170 ; Kloss, Ibis 1918, p. 191.

♂ imm. Nong Kok, Ghirbi, Peninsular Siam. 4 January 1918.
 ♂ Klong Tung Sai, Junk Seylon. 22 December 1917.
 2 ♂ Telok Poh, Pulau Panjang. 23—26 January 1918..
 W. ♂ 69 (imm.), 70; ♀ 72, 72 mm.

86. RHIPIDURA JAVANICA (Sparrm.).

Kloss. Ibis 1918, p. 192.
 ♀ Koh Boi Yai. 3 February 1918.
 W. 73 mm.

87. TERPSIPHONE PARADISI AFFINIS (A. Hay).

Robinson, p. 170.
Terpsiphone affinis, Muller, p. 11.
 ♂ ♀ Nong Kok, Ghirbi, Peninsular Siam. 2—10 January 1918.
 ♂, ♂ imm. ♀ imm. Klong Tung Sai, Junk Seylon. 19—25
 December 1917.
 ♂ Telok Poh, Pulau Panjang. 23 January 1918.
 W. ♂ 87, 87, 84 (imm.) 88; ♀ 87, 79 (imm.),

88. LALAGE FIMBRIATA NEGLECTA (Hume).

Camiphaga neglecta, Robinson & Kloss, Ibis. 1918, p. 54.
 1, ♂ ad. Klong Tung Sai, Junk Seylon. 19 December 1917.
 ♂ ad. Telok Poh, Pulau Panjang. 20 January 1918.
 ♀ Islet off Pulau Panjang. 29 January 1918.
 W. ♂ 97, 104; ♀ 100 mm.
 The species grades from a form with grey head, white under
 tail-coverts and broad white tips to the tail feathers=*L. f. neglecta*
 (Hume) supra, to one with black head, dark grey under tail-coverts and
 only faint grey tips to the tail feathers=*L. schierbrandi* Pelzeln, from
 Borneo.

89. PERICROCOTUS ROSEUS (Vieill.).

Oates, Faun. Brit. Ind. Birds, ii, p. 486 (1889).
 ♀ Klong Tung Sai, Junk Seylon. 21 December 1917.
 W. 87 mm.

This species also has not hitherto been recorded from south
 of Mergui.

90. PERICROCOTUS CINEREUS Lafr.

Robinson, p. 168, Müller, p. 13.

♀ Nong Kok, Ghirbi, Peninsular Siam. 9 January 1918.
W. 93 mm.

91. PERICROCOTUS CANTONENSIS Swinh.

Swinh., Ibis 1861, p. 42.

Pericrocotus cinereus, Robinson & Kloss, Ibis 1911, p. 55 (partim).

♀ Nong Kok, Ghirbi, Peninsular Siam. 5 January 1918.

2 ♂, 2 ♀. Klong Tung Sai, Junk Seylon. 19—23 December 1917.

W. ♂ 92, 87; ♀ 86, 87, 89 mm.

We have two specimens from Chong, Trang, shot on the 10th December 1909, which were erroneously identified as *P. cinereus* in our paper on that collection. The species can always be separated from females and young of *P. cinereus* by the pale clay-coloured rump and upper tail-coverts, these parts being uniform with the mantle in the former species.

The bird has not hitherto been recorded from the Malay Peninsula. It has been obtained at Malewoon, S. Tenasserim, by Mr. Oates collectors (Stray Feathers, X, p. 200 (1887).

92. AEGITHINA VIRIDISSIMA (Bp.).

Robinson, p. 171.

1 ♂ Klong Tung Sai, Junk Seylon. 23 December 1917.

W. 60 mm.

93. AETHORHYNCHUS LAFRESNAYEI (Hartl.).

Iora Lafresnayeri Müller, p. 15.

3 ♂, ♀ Nong Kok, Ghirbi, Peninsular Siam. 3—12 January 1918.

1 ♂ Klong Tung Sai, Junk Seylon. 23 December 1917.

W. ♂ 70, 72, 70, 73 mm; ♀ 69.

94. CHLOROPSIS ICTEROCEPHALA (Wald.).

Robinson, p. 172.

Phyllornis icterocephala, Muller, p. 34.

2 ♀ Klong Tung Sai, Junk Seylon. 22—25 December 1917.

1 ♀ Pulau Sireh, E. side Junk Seylon. 13 February 1918.

W. 79, 78, 76.

95. *CHLOROPSIS CYANOPOGON SEPTENTRIONALIS* subsp. nov.

The northern birds down to about Kedah differ from southern Perak, Selangor, Pahang and Negri Sembilan and also Bornean specimens in having a clearly defined, though narrow, yellow line dividing the black of the throat from the green of the breast. The forehead also is distinctly yellower in the northern birds. These distinctions are quite constant in the large series of specimens available, though we have unfortunately been unable to examine adult males from Sumatra.

Type of the subspecies ♂ and ♀ Nong Kok, Ghirbi, Peninsular Siam. 11 and 8 January 1918.

♂ Wing, 80; tail, 68; tarsus, 18; bill from gape, 19 mm.

♀ Wing, 70; tail, 60; tarsus, 18; bill from gape, 19 mm.

3 ♂ ad., 1 ♂ imm. ♀. Nong Kok, Ghirbi, Peninsular Siam. 2—11 January 1918.

2 ♂ ♀ ad. Chong, Trang, Peninsular Siam. 3—16 December 1909.

2 ♂ ad. Perlis, Malay States, Siam. 3—21 November 1919.

♂ ♀ Gurun, Kedah, Malay States. 14 December 1915.

W. ♂ 80, 81, 78, 80, 76, 73, 81, 78 mm.; ♀ 70, 75, 75 mm.

96. *IRENA PUELLA PUELLA* (Lath.).

Irena puella, Müller, p. 29.

♀ Nong Kok, Ghirbi, Peninsular Siam. 9 January 1918.

4 ♂, 1 ♀ Klong Tung Sai, Junk Seylon. 18—25 December 1917.

3 ♂, 1 ♀, ♂ imm. Telok Poh, Pulau Panjang 21—26 January 1918.

W. ♂ 124, 123, 124, 120, 125, 118, 119, 120; ♀. 114, 118 mm.

97. *MICROTARSUS MELANOCEPHALUS* (Gm.).

Robinson, p. 173.

Proscenna melanocephala, Müller, p. 29.

3 ♂ Nong Kok, Ghirbi, Peninsular Siam. 1—12 January 1918.

1 ♂, 3 ♀ Telok Poh, Pulau Panjang. 20—24 January 1918.

1 ♂ Islet off Pulau Panjang. 30 January 1918.

W. ♂ 78, 78, 79, 79, 78; ♀ 78, 78, 77 mm.

98. *CRINIGER OCHRACEUS* (MOORE).

Criniger cabanisi, Müller, J. f. O. 1882, p. 384.

Criniger sordidus, Richmond, Proc. U. S. Nat. Mus., p. 320 (1900).

Criniger salangae, Sharpe, Handl. Birds, III, p. 316 (1901).

Criniger ochraceus, Robinson, Ibis 1915, p. 746.

♀ Nong Kok, Ghirbi, Peninsular Siam. 6 January 1918.

W. 99 mm.

The Ghirbi bird is sufficiently close to the type locality of *C. cabanisi* Müll. (Junk Seylon) to enable us to predicate that no differences occur in specimens from the two localities. The above specimen agrees exactly with a paratype of *C. sordidus* and others from Trang which we have elsewhere shown to be in all probability referable to *C. ochraceus* Moore, the type of which was obtained by Helfer probably in the Mergui district of Tenasserim.

99. *TRACHYCŌMUS OCHROCEPHALUS* (Gm.).

1 ♂, 3 ♀ Nong Kok, Ghirbi, Peninsular Siam. 8—12 January 1918.

W. ♂ 118; ♀ 122, 118, 120 mm.

100. *PRYNXOTUS ANALIS* (Horsf.).

Loedoruna analis, Muller, p. 27.

Islet off Pulau Panjang. 30 January 1918.

W. 86 mm.

101. *PRYNXOTUS FINLAYSONI* (Strickl.).

Robinson, p. 173.

Loedoruna finlaysoni, Muller, p. 28.

1 ♂, 1 ♀ Nong Kok, Ghirbi, Peninsular Siam. 3—11 January 1918.

1 ♀ Klong Tung Sai, Junk Seylon. 19 December 1917.

W. ♂ 78; ♀ 79, 80 mm.

102. *PRYNXOTUS PLUMOSUS* Blyth.

Robinson, p. 174.

Loedoruna plumosus, Muller, p. 27.

2 ♂ Nong Kok, Ghirbi, Peninsular Siam. 2—12 January 1918.

1 ♂ Klong Tung Sai, Junk Seylon. 24 December 1917.

3 ♂, 3 ♀ Telok Poh, Pulau Panjang. 20—26 January 1918.

♂ ♀ Islet off Pulau Panjang. 30, 31 January 1918.

♀ Koh Naka Yai. 4 February 1918.

W. ♂ 83, 87, 85, 89, 85, 86, 83; ♀ 82, 83, 81, 86, 84 mm.

103. *PYCNONOTUS BRUNNEUS* (Blyth).

Pycnonotus simplex, Robinson, p. 174.

1 ♂, Nong Kok, Ghirbi, Peninsular Siam. 7 January 1918.

♂ ♀ Klong Tung Sai, Junk Seylon. 19—22 December 1917.

W. ♂ 86, 86; ♀ 80 mm.

104. *OTOCOMPSA EMERIA* (Shaw.)

Otocompsa pyrrhotis (Hodg.), Müller, p. 26.

1 ♂, 3 ♀. Nong Kok Ghirbi, Peninsular Siam. 4—7 January 1918.

1 ♂, 2 ♀. Pulau Sireh. 14 February 1918.

W. ♂ 78, 77; ♀ 77, 79, 77, 75, 75 mm.

105. *OTOCOMPSA FLAVIVENTRIS MINOR* Kloss.

Ibis, 1918, p. 200.

♂. Nong Kok, Ghirbi, Peninsular Siam. 4 January 1918.

Wing 82 mm.

Agrees with the type of this slightly differentiated subspecies.

106. *PELLORNEUM SUBOCHRACEUM* Swinh.

Robinson, p. 175.

Pellorneum minor, Müller, p. 19.

2 ♂, 3 ♀ Nong Kok, Ghirbi, Peninsular Siam. 2—11 January 1918.

2 ♂ Klong Tung Sai, Junk Seylon. 22—27 December 1917.

W. 65, 65, 59, 60; ♀ 57, 60, 64 mm.

107. *MALACOCINCLA ABBOTTI* (Blyth).

Trichastoma abbotti. Müller, p. 28.

Malacocincla abbotti, Robinson, p. 175.

Malacocincla abbotti abbotti, Kloss, Ibis 1918, p. 202.

2 ♂, 2 ♀, 1 ? Klong Tung Sai, Junk Seylon. 19—24 December 1917.

4 ♂, 2 ♀ Telok Poh, Pulau Panjang. 19—25 January 1918.

1 ♀ Islet off Pulau Panjang. 28 January 1918.

1 ♀ Koh Boi Yai. 2 February 1918.

W. ♂ 75, 75, 76, 77, 73, 73; ♀ 69, 72, 72, 72, 73 mm.

108. *Turdinus magnirostris* Moore.

♂. Klong Tung Sai, Junk Sylon. 22 December, 1918.

W. 76 mm.

109. *Turdinus macrodactylus* (Strickl.)

Müller, p. 18.

♂. Nong Kok, Ghirbi, Peninsular Siam. 11 January 1918.

W. 87 mm.

This locality marks the northernmost extension of this Malayan Ground-Babbler.

110. *Cyanoderma erythropterum* (Blyth).*Napodes erythroptera* (Blyth), Müller, p. 19.*Cyanoderma erythropterum sordida*, Stuart Baker, Bull. Brit. Orn. Club., XXXVIII, p. 10 (1917).

2 ♂ Klong Tung Sai, Junk Sylon. 19—24 December 1917.

W. 59, 61 mm.

These specimens are no darker than birds from Negri Sembilan, in close vicinity to the original type locality.

111. *Mixornis rubricapilla connectens* Kloss.

Kloss, Ibis 1918, p. 207.

Mixornis rubricapilla rubricapilla, or subsp. nov., Robinson, p. 177.*Mixornis gularis*, Müller, p. 18.

♂ Nong Kok, Ghirbi, Peninsular Siam. 11 January 1918.

♂. ? Klong Tung Sai, Junk Sylon. 25, 26 December.

W. 58, 60, 60 mm.

112. *Myiophoneus eugenei crassirostris* Robinson.

Robinson, p. 178.

6 ♂, 2 ♀. Nong Kok Ghirbi, Peninsular Siam. 31 December, 1917—9 January 1918.

W. ♂ 180, 172, 164, 172, 170, 164; ♀ 170, 157 mm.

All these birds have pale tips to the wing coverts and strongly marked whiter bases to the body feathers, and cannot therefore be referred to *M. eugenei* which occurs at Koh Lak, 250 miles to the north. (vide Ibis 1918, p. 207).

113. *Geocichla citrina citrina* (Lath.).

Robinson, p. 179.

2 ♂ ad., 1 ♂ imm., 3 ♀. Nong Kok, Ghirbi, Peninsular Siam. 1—12 January 1918.

2 ♂, ♀. Klong Tung Sai, Junk Seylon. 18—26 December 1918.

2 ♂, 4 ♀. Pulau Sireh, near Junk Seylon. 13, 14 February 1918.

2 ♂, 3 ♀. Telok Poh, Pulau Panjang. 19—24 January 1918.

2 ♂, ♀ sex ad. Koh Boi Yai. 2 February 1918.

W. ♂ 110, 115, 112, (imm.), 122, 112, 118, 117, 117, 112, 113, 110; ♀ 113, 112, 111, 114, 112, 111, 113, 109, 112, 116, 118, 109 mm.

This fine series shows that old females approach the male in colouration, though they always have some mark of ochraceous on the mantle.

Some immature birds have darker ear-coverts with a paler median transverse bar, therein agreeing with the Hainan bird, "*Turdus citrinus aurinacula*", Hartert, Nov. Zool., XVII, p. 256 (1910). One bird only has no signs of white on the wing coverts. In contradistinction to Oates (Faun. Brit. Ind., Birds, ii. p. 141 (1890), we have never seen a bird south of Trang which has no white on the wing coverts, and doubt if they occur. We do not believe the species is found in Malacca in the modern sense of the word.

114. *TURDUS OBSCURUS* (Gm.).

Robinson, p. 180.

Merula obscura, Müller, p. 5.

2 ♀ ad. Nong Kok, Ghirbi, Peninsular Siam. 11, 12 January 1918.

♀ ad. Telok Poh, Pulau Panjang. 23 January 1918.

♀ ad. Pulau Sireh, W. side Junk Seylon. 14 February 1918.

W. 123, 117, 114, 118 mm.

115. *MONTICOLA SOLITARIUS PANDOO* (Sykes).

Robinson, p. 180.

Monticola solitarius, Müller (part.), p. 5.

♀ Nong Kok, Ghirbi, Peninsular Siam. 12 January 1918.

2 ♂ vix ad. Koh Alang Yai. 8 February 1918.

♀ imm. Telok Poh, Pulau Panjang. 25 January 1918.

W. ♂ 114, 116; ♀. 120, 113.

Agreeing with specimens from the islands further south.

116. *MONTICOLA SOLITARIUS PHILIPPENSIS* (P. L. S. Mull.).

Robinson, p. 181.

Monticola solitarius, Müller, p. 5 (part).

♂ vix ad. ♂ imm. ♀. Nong Kok, Ghirbi, Peninsular Siam. 4—12 January 1918.

W. ♂ 120, 113; ♀ 110 mm.

The nearly adult male has the vent and under-tailcoverts chestnut, the immature male has traces of chestnut on the belly.

117. *MONTICOLA GULARIS* (Swinh.).

Hartert, Vog. Palaarkt. Faun., 1, p. 673 (1910): Robinson, *Ibis* 1915, p. 752.

♂ Nong Kok, Ghirbi, Peninsular Siam. 5 January 1918.

W. 98 mm.

A rare species breeding in Manchuria and East Siberia. Wintering in S. Annam, Cambodia and Siam. One specimen is also on record from the Perak Hills.

118. *HYDROCICHLA FRONTALIS* (Blyth).

♂, ♀ imm Klong Tung Sai, Junk Seylon. 25, 26 December 1918.

W. ♂ 88; ♀ 88 mm.

119. *LARVIVORA CYANEA* (Pall.).

Robinson, p. 181.

♂ ad. Telok Poh, Pulau Panjang. 21 January 1918.

♀ ad. Klong Tung Sai, Junk Seylon, 22 December 1917.

W. ♂. 71 mm. ♀. 67 mm.

120. *COPSYCHUS SAULARIS MUSICUS* (Raffles).

Copsychus mindanensis, Müller, p. 6.

♂. Klong Tung Sai, Junk Seylon. 26 December 1917.

W. 94 mm.

The pale ashy brown colouration on the sides of the flanks is much more marked than in most Malayan specimens.

121. *KITTACINCLA MACRURUS MACRURUS* (Gm.).

Robinson, p. 181.

Copsychus macrourus, Müller, p. 8.

3 ♂, ♀. Nong Kok, Ghirbi, Peninsular Siam. 2—12 January 1918.

♂, ♀ Klong Tung Sai, Junk Seylon. 21—24 December 1917.

♂ Telok Poh, Pulau Panjang. 20 January 1918.

♂ Koh Boi Yai, E. side Junk Seylon. 2 February 1918.

W. ♂ 92, 94, 93, 91, 92, 94; ♀. 85, 85 mm.

122. ORTHOTOMUS ATRIGULARIS (Temm.).

Robinson, p. 182.

♂ Islet off Pulau Panjang. 30 January 1918.

W. ♂ 45 mm.

123. FRANKLINIA RUFESCENS Blyth.

Franklinia rufescens beavani, Kloss, Ibis 1918, p. 211.

2 ♂, 2 ♀. Nong Kok, Ghirobi, Peninsular Siam. 9 January 1918.

W. ♂ 41, 43; ♀ 39, 41 mm.

124. ARUNDINAX AEDON (Pall.).

Luscinola aedon, Seebohm, Cat. B. Brit. Mus. V. p. 121.

2 ♂. Nong Kok, Ghirobi, Peninsular Siam. 1—11 January 1918.

W. 74, 77 mm.

This is the first authentic record of this species for the Malay Peninsula, though it has been obtained by Davison as far south in Tenasserim as Malewoon (Stray Feath. VI. p. 339 (1878).

125. PHYLLOSCOPUS SUPERCILIOSA SUPERCILIOSA (Gm.).

Robinson, p. 183.

♂ Nong Kok, Ghirobi, Peninsular Siam. 9 January 1918.

♂ Islet near Pulau Panjang. 30 January 1918.

W. 56, 57 mm.

126. PHYLLOSCOPUS BOREALIS BOREALIS (Blas.).

Robinson, p. 183.

4 ♂, 2 ♀. Nong Kok, Ghirobi, Peninsular Siam. 2—9 January 1918.

3 ♂. Klong Tung Sai, Junk Seylon. 20—25 December 1917.

2 ♀. Islet near Pulau Panjang. 30 January 1918.

W. ♂, 61, 64, 62, 63, 63, 66, 62; ♀, 61, 61, 67, 62 mm.

These specimens have the first primary very narrow and short, extending beyond the primary coverts.

♂ Nong Kok, Ghirobi, Peninsular Siam. 12 January 1918.

♂ Klong Tung Sai, Junk Seylon. 25 December 1917.

♂ Telok Poh, Pulau Panjang. 21 January 1918.

W. 64, 62, 62 mm.

These birds are slightly darker above, with the first primary

broadly and decidedly longer; but in view of their size they can hardly be considered *P. b. xanthodryas* Swinh. The whole series have the second primary between the 5th & 6th in length.

127. *PHYLLOSCOPUS CORONATA* (Temm. & Schleg.).

Müller, p. 10.

♂, ♀. Klong Tung Sai, Junk Seylon. 19—26 December 1917.

W. ♂ 61 ♀ 57 mm.

128. *TEPHRODORNIS PELVICUS ANNECTENS* Rob. & Kloss.

Journ. Fed. Malay States. Mus., VIII, p. 222 (1918).

Tephrodornis gutaris, Müller, p. 19.

5 ♂. Klong Tung Sai, Junk Seylon. 20—26 December 1917.

W. 102, 103, 104, 105, 108 mm.

129. *PLATYLOPHUS ARDESIACUS* Cab.

Robinson & Kloss, Ibis 1911, p. 69.

♂, ♀. Nong Kok, Ghirbi, Peninsular Siam. 11 January 1918.

W. 143, 137 mm.

130. *LANIUS CRISTATUS CRISTATUS* Linn.

Robinson, p. 184.

2 ♂. Nong Kok, Ghirbi, Peninsular Siam. 3, 4 January 1918.

♂. Klong Tung Sai, Junk Seylon. 27 December 1917.

♀ Islet off Pulau Panjang. 30 January 1918.

W. ♂ 85, 88, 84, ♀. 87 mm.

131. *MELANOCHLORA SULTANEA FLAVOCRISTATA* (Lafr.).

Robinson & Kloss, Ibis 1911, p. 70.

Müller, p. 30.

♂. Nong Kok, Ghirbi, Peninsular Siam. 9 January 1918.

W. 99 mm.

132. *CORVUS MACRORHYNCHUS* (Wagl.).

Robinson & Kloss, Ibis 1911, p. 71.

♀. Nong Kok, Ghirbi, Peninsular Siam. 31 December 1917.

W. 317 mm.

133. *PLATYSMURUS LEUCOPTERUS* (Temm.).

Robinson & Kloss, Ibis 1911, p. 71.

Glennargus leucopterus, Müller, p. 41.

2 ♂, 2 ♀. Nong Kok, Ghirbi, Peninsular Siam. 5--11 January 1918.

W. ♂ 192, 185; ♀ 194, 181 mm.

134. *DICRURUS ANNECTENS* (Hodgs.).

Robinson, p. 186, Müller, p. 31.

1 ♂ ad. Nong Kok, Ghirbi, Peninsular Siam. 1 January 1918.

4 ♂ ad, 3 ♂ imm, 2 ♀ ad. 2 ♀ imm. Klong Tung Sai, Junk Seylon. 18--26 December 1917.

2 ♀ imm. Telok Poh, Pulau Panjang. 24--26 January 1918.

2 ♂ ad. 4 ♀ ad. 1 ♀ imm. Islet off Pulau Panjang 28--30 January 1918.

1 ♀ imm. Telok Palas, Junk Seylon. 7 February 1918.

1 ♂, ♀. ad. Pulau Sireh. 13 February 1918.

W. ♂ 146, 144, 141, 152, 146, 144, 139, 145, 140, 139, 145; ♀. 146, 141, 142, 132, 142, 144, 147, 145, 142, 145, 148, 139, 141 mm.

No bird of this species has ever been obtained in the middle of the winter in Indo-China north of about 15° N., or in midsummer in Tenasserim and the Malay Peninsular south of about the same latitude, so that we must conclude (as indeed is confirmed by observations in the Straits of Malacca) that this species is a strictly migratory bird and that *Edolius affinis* Blyth, has therefore no existence as a distinct form. A re-examination of the type series of *D. a. siamensis* Kloss (Ibis 1918, p. 226) shows that they are probably not conspecific with this bird.

135. *BUCHANGA LONGICAUDATA INTERMEDIA* Blyth.

Journ. Asiat. Soc. Bengal, p. 298 (1846).

Dicrourus leucophaeus, Müller, p. 31.

Dicrurus nigrescens Oates, Faun. Brit. Ind., Birds, i, p. 315 (1889.)

3 ♂, 1 ♀. Islet off Pulau Panjang. 29, 30 January 1918.

W. ♂ 131, 129, 126; ♀ 134 mm.

This form does not extend further south than Kedah town, whence we have four specimens shot in November 1915.

136. *BUCHANGA LEUCOGENYS* Walden.

Dicrurus leucogenys, Robinson & Kloss, Ibis 1911, p. 72.

Dicrurus leucogenys var *salangensis*, Rehnw., Nomencl. Mus, Hein., p. 69. (1890).

Buchanya leucogenys, Müller, p. 31.

3 ♂, 2 ♀. 1 ? Nong Kok, Ghirbi, Peninsular Siam. 2—9 January 1918.

1 ♀. Klong Tung Sai, Junk Seylon. 25, 26 December 1917.

♀. Telok Palas, Junk Seylon. 7 February 1918.

2 ♂, 1 ♀. Islet off Pulau Panjang. 28—31 January 1918.

W. ♂, 140, 140, 136, 139, 142, 146; ♀. 140, 132, 141, 137; (?) 144 mm.

137. DISSEMURUS PARADISEUS.

Nong Koh, Ghirbi, Peninsular Siam. 4 January 1918.

W. 136 mm.

The precise definition of races of *D. paradiseus* is rendered difficult by lack of knowledge as to the exact locality in Siam of the typical specimen of Brisson.

"Siam" as a geographical entity is inhabited by forms to which at least two subspecific names have been applied, beside the typical one viz., *D. p. rangoonensis* by Gyldenstolpe and *D. p. malayensis* by Kloss.

138. ORIOLUS INDICUS Jerd.

Müller, p. 38; Robinson, p. 188.

4 ♂ ad., 6 ♀ ad., 6 ♀ imm. Nong Kok, Ghirbi, Peninsular Siam. 1—12 January 1918.

2 ♂ ad., 2 ♀ ad., 1 ♀ imm. Telok Poh, Pulau Panjang. 20—24 January 1918.

2 ♂ ad., 1 ♀ ad., 1 ♀ imm. Islet off Pulau Panjang. 28—30 January 1918.

1 ♀ imm. Pulau Sireh. 13 February 1918.

W. ♂ 148, 149, 151, 141, 146, 146, 145, 161; ♀ 153, 150, 150, 152, 144, 143, 142, 145, 144 mm.

The adult females, in addition to their greener backs, appear to differ from adult males in being slightly paler yellow beneath, while even in the most adult birds there remain faint traces of shaft stripes on the lower breast feathers.

139. ORIOLUS MELANOCEPHALIUS (Linn.).

Müller, p. 40; Robinson, p. 187.

Oriolus luteolus thaiacous, Hartert, Bull. Brit. Orn. Club, XXXVIII, p. 63 (1918).

♀. Nong Kok, Ghrbi, Peninsular Siam. 3 January 1918.

W. 126 mm.

We have elsewhere given our reasons for considering that the Indo-Chinese form of this Oriole cannot be regarded as a valid race.

140. *GRACULA JAVANA INTERMEDIA* (A. Hay).

Eulables intermedia, Muller p. 36.

1 ♂, 1 ♀. Nong Kok, Ghrbi, Peninsular Siam. 5, 6 January 1918.

3 ♀. Klong Tung Sai, Junk Seylon. 23—27 December 1917.

W. ♂ 164; ♀ 155, 161, 156, 163 mm.

These specimens, all with very small bills, are true *G. j. intermedia* which occurs, together with *G. j. javana*, in Trang.

Specimens from the islands of the Bandon Bight, referred by us to this form, are intermediate between the two races.

141. *APLONIS PANAYENSIS STRIGATUS* (Horsf.).

Robinson, p. 185.

Calornis chalybaeus, Müller, p. 35.

3 ♂, 1 ♀. Nong Kok, Ghrbi, Peninsular Siam. 3—10 January 1918.

1 ♂, 1 ♀. Telok Poh, Pulau Panjang. 25 January 1918.

1 ♂, 2 ♀. Islet near Pulau Panjang. 28, 29 January 1918.

W. ♂ 94, 99, 103, 102, 99; ♀ 98, 97, 97, 97 mm.

142. *AMPELICEPS CORONATUS* Blyth.

Müller, p. 36.

2 ♂, 1 ♀ Nong Kok, Ghrbi, Peninsular Siam. 31 December --2 January 1918.

W. ♂ 129, 125; ♀ 127 mm.

Slightly immature males have the feathers of the crown mixed with black.

143. *PLOCEUS MEGARHYNCHUS INFORTUNATUS* Hartert.

♂, ♀. Islet off Pulau Panjang. 29 January 1918.

W. ♂ 69 mm.

144. *MOTACILLA FLAVA SIMILLIMA* Hartert.

Vog. Palaarkt. Faun., i, p. 289.

♀. Nong Kok, Ghirbi, Peninsular Siam. 8 January 1918.
W. 80; T. 81 mm.

A rare bird in the Malay Peninsula where *M. b. melanope* far outnumbered it. We have two specimens from Temerloh, Perak, 11—26 January 1911, and one from Pulau Lalang, Sembilan Islands, 15 October 1911. They can be most readily separated from other local wagtails by their short tail.

145. *DENDRONANTHUS INDICUS* (Gm.).

♂ ♂, ♀. Nong Kok, Ghirbi, Peninsular Siam. 31 Dec.—1 Jan. 1918.

♂ ♂ 1 ♀. Klong Tung Sai, Junk Seylon. 21—25 December 1918.

W. ♂ 77, 79, 77, 75, 77, 79; ♀. 79. 5; (?). 76 mm.

146. *ANTHUS RICHARDI MALAYENSIS* Eyton.

Robinson, p. 186; Kloss, Ibis 1918, p. 220.

Corydalla malayensis, Müller, p. 9.

♀ Nong Kok, Ghirbi, Peninsular Siam. 8 January 1918.

♀ Islet near Pulau Panjang. 21 January 1918.

W. 77. 75 mm.

147. *AETHOPYGA SIPARAJA CARA* Hume.

Aethopyga cara, Müller, p. 22.

Aethopyga siparaja cara, Robinson, p. 190.

1 ♀. Klong Tung Sai, Junk Seylon. 23 December 1918.

1 ♀. Pulau Sireh. 13 February 1918.

W. 48, 50 mm.

148. *CYRTOSTOMUS FLAMMAXILLARIS* (Blyth).

Robinson p. 190; Müller p. 25.

♂ Nong Kok Ghirbi, Peninsular Siam. 11 January 1918.

♂ Klong Tung Sai, Junk Seylon. 24 December 1917.

1 ♀. Telok Poh, Pulau Panjang. 20 January 1918.

2 ♂ Pulau Panjang North. 31 January 1918.

3 ♂ 1 ♀. Koh Maprau. 10 February 1918.

1 ♂. Koh Boi Yai. 3 February 1918.

W. ♂ 52, 50, 53, 52, 51, 54, 51, 50, 51; ♀ 51, 48 mm.

149. *ANTHOTHREPTES HYPOGRAMMICA* (Müll.).

♂. Klong Tung Sai, Junk Seylon. 23 December 1918.

W. 67 mm.

150. *ANTHOTHREPTES MALACCENSIS* (Scop.).

Robinson, p. 191; Muller, p. 23.

1 ♂, 2 ♀ Pulau Panjang North. 29—31 January 1918.

5 ♂, 1 ♂ imm; 4 ♀. Koh Maprau. 10, 11 February 1918.

W. 68, 67, 65, 66, 65, 69, 66 (imm); ♀. 64, 60, 63, 62, 61, 67. mm.

151. *CHALCOPARIA SINGALENSIS* (Gm.).

Robinson, p. 191.

♂ ad., ♂ imm., ♀ Klong Tung Sai, Junk Seylon. 25, 26 December 1917.

W. 53, 53 (imm.); ♀ 53.5 mm.

These three specimens are nearer to the typical form from the vicinity of Malacca than those from Terutau and Bandon referred to above. The northern bird, *C. s. koratensis* Kloss, presents marked differences.

152. *ARACHNOTHERA LONGIROSTRIS* (Lath.).

Müller, p. 25.

♂ Nong Kok, Ghirbi, Peninsular Siam. 20 January 1918.

W. 64 mm.

153. *DICAËUM CRUENTATA IGNITA* (Beglie).

Robinson, p. 189.

Dicaeum cruentatum, Müller, p. 21.

♂. ♀. Islet off Pulau Panjang. 31 January 1918.*

W. ♂ 51; ♀. 44 mm.

154. *DICAËUM TRIGONOSTIGMA* (Scop.).

Robinson, p. 189; Muller, p. 22.

♂, ♀. Islet off Pulau Panjang. 30, 31 January 1918.

W. ♂ 58; ♀. 46 mm.

155. *DICAËUM CHRYSORRHEUM* Temm.

Robinson, p. 189; Muller, p. 22.

1 ♂. Nong Kok, Ghirbi, Peninsular Siam. 12 January 1918.

W. 61 mm.

A LIST OF SIAMESE AND LAO NAMES OF MAMMALS.

By K. G. GAIRDNER, C. M. Z. S.

In the accompanying list I have endeavoured, as far as possible, to follow the Royal Geographical Society's system of transliteration, that is to say the vowels carry the continental value, and the consonants are pronounced as in English. I wish to thank Messrs. P. R. Kemp, A. J. Irwin, T. H. Lyle and H. St. J. Yates for their valuable assistance in its preparation.

Genus or species	English.	Siamese	Lao
<i>Hylobates lar</i> ...	White-handed gibbon	Cheni	I-huey
<i>Macaca siamica</i> ...	The cliff macaque	—	I-work
<i>Macaca arctoides</i> and <i>rufescens</i> ...	Rufous stump-tailed monkey }	Ling sen or Koh-bot }	—
<i>Macaca nemestrina</i> ...	Pig-tailed monkey	Kang	—
<i>Macaca irus</i> ...	Crab-eating monkey	Ling seneh	—
<i>Pithecus</i> (<i>5 species</i>)	Langur or Long-tailed monkey }	Kharrng	Kharrng
<i>Nycticebus cinereus</i>	Slow loris or Wind monkey }	Ling lom	—
<i>Felis tigris</i> ...	Tiger	Sua khrrong เตี๋ยไคว้ง	I-uang Sua khrrong

Genus or species	English	Siamese	Lao
<i>Felis pardus</i> ...	Leopard	{ Sūa dao or Sūa lai talub	Sua lai mabah or Sua pao
<i>Felis temmincki</i> ...	Golden cat	Sūa fai	Sua fai
<i>Felis viverrina</i> ...	Fishing cat	Sūa pla	Sua pa
<i>Felis bengalensis</i>	Leopard cat	{ Meo pa	Mao pa
<i>Felis chaus</i> ...	Jungle cat	Chemot	Hen-kuk
<i>Viverra zibetha pruinosa</i> ...	Burmese civet	I-hen	{ Hen dap lao Hen dork lao
<i>Paradoxurus and Paguma</i> species ...	Palm civets	Mi kaw	Kra-chou *
<i>Arctictis binturong</i> ...	Bear cat	Phāng-pawn	Phang-pawn
<i>Mungos siamensis</i> ...	Mongoose	Ma ching-chawk	{ Ma pi or Ma chuk-waw
<i>Canis aureus</i> ...	Jackal	Ma nai or	Ma nai or
<i>Cuon rutilans</i> or <i>javanicus</i>	Malay wild-dog	{ Ma pa	Ma pa

• Karen.

Genus or species	English	Siamese		Lao
<i>Aretonyx collaris</i> <i>dictator</i>	Hog-badger	{	Ma leung or	Ma leung
<i>Lutra (species)</i> ...	Otter		Mu leung	Nak or Buan
<i>Ursus torquatus</i> or tibe- tanus ...	Himalayan black bear	{	Nak	Mi kwai
<i>Ursus malayanus</i> ...	Malay bear		Mi kwai	—
<i>Tupaia (species)</i> ...	Tree shrews	{	Mi ma or	—
<i>Pachyura (species)</i> ...	Pygmy shrews		Mi mu	—
<i>Parascaptor (species)</i> ...	Moles	{	Kra-teh	—
<i>Galeopterus temmincki</i> <i>peninsulæ</i> ...	Flying lemur		Nu pi	—
<i>Pteropus (species)</i>	Fruit-bats or Flying-foxes	{	Tun or toon	—
<i>Petaurista, Pteromys, and</i> <i>Sciuropterus</i> ...	Flying squirrels		Bang	—
		{	Karng-kao	Hoong kao
			Bang or	Bang-u-lah
		{	Bang nai	

Genus or species	English	Siamese		Lao
<i>Sciurus (species) ...</i>	Squirrels	Kra-rawk	กระรอก	Hawk
<i>Tamias (species) ...</i>	Side-striped small squirrels	Kra-teh ?	กระแต	I-hai
<i>Ratufa (species) ...</i>	Large black & yellow squirrel	Ma mai	หมาไม่	Dang ?
<i>Rattus (species) ...</i>	House rats	Nu tong kao	หนูทองขาว	Nu
	Field rats	Nu puk	หนูปัก	
	House mice	Nu ring or	หนูริง	
		Nu pi	หนูผี	Nu puk
<i>Nyctoleptes cinereus</i> ...	Large bamboo-rat	On	อน	On
<i>N. badius</i> ...	Small bamboo-rat	Tun	ตุน	Tun
<i>Acanthion brachyurus</i> ...	Short-tailed porcupine	Men	เม่น	Men
<i>Lepus siamensis</i> ...	Siamese hare	Kra-tai	กระต่าย	Kra-tai
<i>Elephas maximus</i> ...	Indian elephant	Chang pah	ช้างป่า	Chang
—	Songkla dwarf elephant	Chang kawm	ช้างค่อม	—

Genus or species	English	Siamese		Lao
		Ret	Ret	
Rhinoceros sondaicus	Small one-horned rhinoceros		แรด	Het
Rhinoceros sumatrensis	Asiatic two-horned rhinoceros		กระทิง	Su
Tapirus indicus ...	Malay tapir		พรหมเสด	Sam-ngao?
Bos gaurus ...	Bison or sladang.		วัวกระทิง	{ Ngua kating or ngua dum
Bos banteng birmanicus	Wild cattle or banting		วัวแดง	Ngua deng
Bos bubalus ...	Wild buffalo		ควาย	Kwai pa
Ovis (species;) domestic	Sheep		แกะ	—
Capra (species domestic)	Goats		แพะ	—
Nemorhaedus (species;)	Goat-antelope or Serow		เสดง	{ Hiang or Kwang pa
Cervulus (species;)	Barking deer		อีเก้ง	Fan
Cervulus feae ...	Black barking deer		อีเก้ง	T'kra-kaw-su *
Rucervus platyceros	Brow-antlered deer		ตะมาง	Lawoe

* Karen.

Genus or species	English	Siamese	Lao
<i>Cervus unicolor equinus</i> ...	Malay sambar	Kwang or Nua	Kwang or Nua
<i>Cervus schomburgki</i> ...	Schomburgk's deer	Saman	La-ong
<i>Cervus porcinus</i> ...	Hog deer	Nua sai	—
<i>Tragulid (species ?)</i>	Mouse deer	Kra-chong	Khi ?
<i>Sus cristatus</i> ...	Wild pig	Mu pa	Mu pa
<i>Cetacea (species ?)</i>	Whales	Pla wan	—
Porpoises	Porpoises	Pla lo-ma hua bat	—
<i>Manis javanica</i> ...	Pangolin or Scaly ant-eater	Nim	Lin or Len

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A LIST OF THE MAMMALS AT PRESENT KNOWN
TO INHABIT SIAM.

BY NILS GYLDENSTOLPE, D. SC.

Our knowledge of the Mammalian Fauna of Siam has increased much during the last few years and numerous additions have been made since Mr. Stanley S. Flower drew up his list "On the Mammalia of Siam and the Malay Peninsula", which was published in the Proceedings of the Zoological Society, London, 1900, pp. 306-379.

The compilation of a nominal list of the Mammals at present known to inhabit Siam may, therefore, be of some use, and no apology seems to be needed for publishing it. Many new forms have recently been added to the Fauna of Siam, but much work still remains to be done before a complete list may be drawn up. However, the author has tried to do his best to make the list as complete and up to date as possible.

A few brief remarks are attached to each species and subspecies, as to their geographical distribution in the country, and the divisions used are those drawn up and defined by Mr. C. Boden Kloss, though with some small additions.

No bulky list of synonyms has been added to each species, but some short references are given as to where the original descriptions are to be found, so that they may easily be looked up. The type localities are also mentioned, but as the older authors generally did not definitely state where their new forms were obtained, it has not been possible to ascertain the type localities of some of the species.

- As has been already stated above, the work of naturalists during the last fifteen years, during which period there has been a great revival of interest in the Zoology of Siam and neighbouring countries, has added a considerable number of species now known to inhabit Siam. This number has also been increased by the discovery of geographical races in the adjacent islands that had hitherto remained unvisited.

At the moment of writing, the Mammal Fauna of Siam has swollen to a total of three hundred and four species and subspecies, but of these nearly sixty are Island races, found exclusively on the Islands of Salanga (Puket), Terntau, Pulu Adang, Pulu Rawi, etc., off the western coast of Peninsular Siam, and on others situated in the Gulf of Siam.

Quite a number of small Islands along the western coast of Peninsular Siam have not been visited and explored zoologically up to the present time, and on these several new insular races would most certainly be obtained if the localities were found worth while to be visited by a trained naturalist.

ORDER PRIMATES.

1. HYLOBATES PILEATUS Gray.

Hylobates pileatus, Gray. P.Z.S. 1861, p. 136. (Cambodia).

Recorded from South-eastern and Central Siam (Paknam Krabin).

2. HYLOBATES LAR (Linn.).

Homo lar, Linnaeus. Mantiss. Plant. 1771, Appendix, p. 521. (India).

Common in suitable localities throughout the whole country.

3. HYLOBATES LEUCOGENYS Ogilby.

Hylobates leucogenys, Ogilby. P.Z.S. 1840, p. 29. (Siam).

"Siam," without definite locality. No recent specimens have been obtained.

4. PRESBYTIS NEGLECTA KEATHI Rob. & Kloss.

Presbytis neglecta keathi, Robinson & Kloss. Journ. F.M.S. Mus., IV. 1910, p. 174. (Ko-khau, Trang, Peninsular Siam).

Inhabits Peninsular Siam, where specimens have been recorded

from Bandon, Khao Wang Hip, Jalor, etc., extending northwards at least as far as the Province of Ratburi.

5. PRESBYTIS BARBEI Blyth.

Presbytis Barbei, Blyth. Journ. Asiat. Soc. Bengal, XVI, 1847, p. 734. (Ye, Tenasserim).

Hitherto only obtained in the Province of Ratburi.

6. PRESBYTIS PHAYREI (Blyth).

Semnopithecus phayrei, Blyth. Journ. Asiat. Soc. Bengal, XVI, 1847, p. 733. (Arakan).

Only recorded from Ratburi, where specimens have been collected at Si-sa-wad, 14° 40' N. Lat.

7. PRESBYTIS OBSCURA FLAVICAUDA (Elliot).

Pygathrix flavicauda, Elliot. Proc. U. S. Nat. Mus, XXXVIII, 1910, p. 352. (Trang, Peninsular Siam).

Inhabits Peninsular and South-western Siam at least north to Ratburi.

8. PRESBYTIS OBSCURA SMITHI Kloss.

Presbytis obscura smithi, Kloss. Journ. N. H. Soc. Siam, II, 1916, p. 5. (Klong Bang Lai, Patiyu, Peninsular Siam).

Hitherto only known from the type locality.

9. PRESBYTIS OBSCURA HALONIFER (Cantor).

Semnopithecus halonifer, Cantor. Proc. Linn. Soc., I, 1845, p. 235. (Malay Peninsula).

Obtained at Koh Pennan and in the mountain regions west of Koh Lak, South-western Siam.

10. PRESBYTIS OBSCURA CORVUS Miller.

Presbytis corvus, Miller. Smiths. Misc. Coll., vol. 61, No. 21, 1913, p. 27. (Pulau Terutau).

An Island race inhabiting Pulau Terutau, off the west coast of Peninsular Siam.

11. PRESBYTIS ROBINSONI Thos.

Presbytis robinsoni, Thomas. Abstr. P. Z. S. 1910, p. 25. (Ko-Keau, Trang Peninsular Siam).

Only known at present from Trang and Bandon, both situated in Peninsular Siam.

12. *PRESBYTIS SIAMENSIS* (Müll. & Schleg.).

Semnopithecus siamensis, Müll. & Schleg, Verhandl. Natur. Geschied. 1841, p. 60. (Siam).

Recorded at present only from Takhamen, in Central Siam, west of Bangkok. (Specimen preserved in the British Museum of Natural History).

13. *PRESBYTIS GERMAINI* (M. Edw.).

Semnopithecus germaini, M. Edw. Bull. Soc. Philom. 1876. (Cochin China).

Inhabits Eastern and South-eastern Siam, but extends westwards to the Province of Ratburi. (*vide* Gairdner).

14. *PRESBYTIS GERMAINI MANDIBULARIS* Kloss.

Presbytis germaini mandibularis, Kloss. P. Z. S. 1916, p. 32. (Koh Chang),

A slightly differentiated island race inhabiting Koh Chang, off the coast of South-eastern Siam.

15. *PRESBYTIS CREPUSCULA* Elliot.

Presbytis crepuscula, Elliot. Ann. & Mag. Nat. Hist. (8) IV, 1909, p. 271. (Mooleyit, Tenasserim).

Found in the mountain regions of Northern Siam. It probably also inhabits the mountains on the boundary between Siam and Tenasserim, though no specimens from there have yet been obtained.

16. *PRESBYTIS CREPUSCULA WROUGHTONI* Elliot.

Presbytis crepuscula wroughtoni, Elliot. Ann. & Mag. Nat. Hist. (8) IV, 1909, p. 272. (Petchabun, Central Siam).

Only known from two specimens obtained in the type locality.

17. *MACACA NEMESTRINA ADUSTA* Miller.

Macaca adusta, Miller, Proc. U. S. Nat. Mus. XXIX, 1906, p. 559 (Champang, Tenasserim).

Met with in the Provinces of Ratburi and Petchaburi by Gairdner, but distribution still uncertain.

18. *MACACA ANDAMANENSIS* Bartlett.

Macaca andamanensis, Bartlett. Land and Water. III, 1869, p. 57. (Arakan).

Inhabits the whole of Siam, though its southern limits of range have not been ascertained.

19. *MACACA SIAMICA* Kloss.

Macaca siamica, Kloss. Journ. N. H. S. Siam, II, 1917, p. 247.
(Me Ping rapids below Chiengmai, Northern Siam.)

Northern Siam and Laos.

20. *MACACA ARCTOIDES RUFESCENS* Anders.

Macacus rufescens, Anderson. P. Z. S. 1872, p. 204. (Singapore?)

Recorded from Laos and Ratburi, and from Patelung, Peninsular Siam.

21. *MACACA ARCTOIDES HARMANDI* Trouess.

Macacus harmandi, Trouessart. Le Naturaliste, 1897, p. 10. (Mountains between Siam and Cambodia.)

The distribution of this form is still uncertain, but it may probably be found in South-eastern Siam.

22. *MACACA IRUS* Cuv.

Macacus irus, F. Cuv. Mém. Mus. Hist. Nat. Paris, IV, 1818, p. 120.

The Crab-eating Monkey is widely distributed in Siam, and specimens have been recorded from Bangkok and the Chao Phya river (Central Siam), Koh Lak, Pak Klong Pran, Pak Nam Chumporn and Ratburi (S. W. Siam.), Sakerat (E. Siam.), Singora, Patani, Nawngchik and Jering (Peninsular Siam) and from the Islands of Koh Kut, Koh Chang, Koh Samui and Koh Pennan, all situated in the Gulf of Siam.

23. *MACACA CAPITALIS* (Elliot).

Pithecus capitalis, Elliot. Proc. U. S. Nat. Mus. XXXVIII, 1910, p. 350. (Trang, Peninsular Siam).

This form is as yet only known from the type locality.

ORDER PROSIMIAE.

24. *NYCTICEBUS COUCANG* (Bodd.).

Tardigradus coucang, Boddaert. Elench. Anim. 1784, p. 67.
("Bengal.")

Inhabits Northern Siam and Laos.

25. *NYCTICEBUS CINEREUS* M. Edw.

Nycticebus cinereus, M. Edw. Ann. Mus. Hist. Nat. Paris, VII, 1867, p. 161. (Siam.).

Found in Central Siam, from where it extends southwards at least as far as Koh Lak.

26. *NYCTICEBUS MALAIANUS* Anders.

Nycticebus tardigradus var. *malaianus*. Anders. Cat. Mamm. Ind. Mus. 1, 1881, p. 95. (Malay Peninsula.)

Fairly common in Peninsular Siam, including the Island of Salanga (Puket).

ORDER CHIROPTERA.

SUBORDER MEGACHIROPTERA.

27. *ROUSETTUS LESCHENAULTI* (Desm.).

Pteropus leschenaulti, Desm. Encycl. Méth. Mamm. 1, p. 110. No. 142. 1820. (Pondichery).

In the British Museum of Natural History there are specimens obtained in the Laos mountains by Mouhot.

28. *PTEROPUS LYLEI* K. And.

Pteropus lylei, K. Andersen. Ann. Mag. Nat. Hist. (8) II, 1908, p. 367. (Bangkok).

Authentic specimens have only been recorded from Bangkok and from Petchaburi in South-western Siam.

29. *PTEROPUS HYPOMELANUS CONDORENSIS* Peters.

Pteropus condorensis, Peters. M. B. Akad. Berlin, 1869, p. 393. (Pulau Condor).

This species has recently been met with on Koh Mak and on Koh Rung. Otherwise it has only been recorded from "Siam" by some of the older authors, such as Horsfield, and now recently by K. Andersen.

30. *PTEROPUS VAMPIRUS MALACCENSIS* K. And.

Pteropus vampyrus malaccensis, K. Anderson. Ann. & Mag. Nat. Hist. (8) II, 1908, p. 368. (Pahang).

Obtained in different localities in Peninsular Siam, and on the Island of Koh Kut in the Gulf of Siam.

31. *PTEROPUS INTERMEDIUS* K. And.

Pteropus intermedius, K. Andersen, Ann. & Mag. Nat. Hist. (8) II, 1908, p. 368. (Amherst).

S. S. Flower met with this form on the Bangpakong river, and

Kloss obtained it at Krabin in Central Siam. Besides these records it has been collected at Trang, Peninsular Siam.

32. *CYNOPTERUS SPHINX SPHINX* (Vahl.).

Vespertilio sphinx, Vahl. Skr. Nat. Selsk. IV, Heft I, 1797, p. 123. (Tranquebar).

Inhabits Northern Siam, from where it extends southwards at least as far as Patani in Peninsular Siam.

33. *CYNOPTERUS BRACHYOTIS BRACHYOTIS* (S. Müll.).

Pachysoma brachyotis, S. Müll. Tijd. Nat. Geschied, V, pt. I, 1838, p. 146. (Borneo).

Obtained at Koh Lak in South-western Siam and on several of the Islands in the Gulf of Siam, viz., Koh Mehsi, Koh Kra, Koh Klum and Koh Kut.

34. *CYNOPTERUS BRACHYOTIS ANGULATUS* Miller.

Cynopterus angulatus, Miller. Proc. Acad. Nat. Sci. Philad. 1898, p. 316. (Trang, Peninsular Siam).

Recorded from Koh Lak (S. W. Siam) and from the district of Bandon (Peninsular Siam). Also found as far north as at Pak Koh and Chiangmai, and on some of the islands in the Gulf of Siam, such as Koh Chang, Koh Samui and Koh Pennan.

35. *CYNOPTERUS HARPAX* Thos. & Wrought.

Cynopterus (Niadus) harpax, Thos. & Wrought. Ann. & Mag. Nat. Hist. (8) III. 1909, p. 439. (Semangko Pass).

In Siam this species has yet only been met with at Doi Vieng Par and Doi Par Sakeng in North-western Siam, but it probably inhabits the mountain regions of the whole country.

36. *EONYCTERIS SPELÆA* (Dobs.).

Macroglossus spelæus, Dobson. Proc. Asiat. Soc. Bengal, 1871, pp. 105, 106. (Moulmein, Burma).

Found in Northern Siam where specimens have been collected at Nan.

37. *MACROGLOSSUS MINIMUS SOBRINUS* K. And.

Macroglossus minimus sobrinus, K. Anderson. Ann & Mag. Nat. Hist. (8) VII. 1911, p. 642. (Perak).

Recorded from Patani in Peninsular Siam by Bonhote and Kloss. Otherwise it has been mentioned by several authors as an inhabitant of "Siam".

SUBORDER MICROCHIROPTERA.

38. RHINOLOPHUS COELOPHYLLUS Peters.

Rhinolophus coelophyllus, Peters. P. Z. S. 1866, p. 426. (Salween, Burma).

Hitherto only obtained and recorded by the present author from Koh Lak in South-western Siam.

39. RHINOLOPHUS LUCTUS Temm.

Rhinolophus luctus, Temm. Monogr. Mamm. II, 1835, pp. 24-26, pl. XXX. (Tapos, Java).

Gairdner has met with this species in the Province of Ratburi. Otherwise it has been recorded from "Siam" by Ponsarges.

40. RHINOLOPHUS TRIFOLIATUS Temm.

Rhinolophus trifolius, Temm. Monogr. Mamm. II, 1835, p. 27, pl. XXXI. (Java).

Of this widely spread species, authentic specimens have only been collected at Klong Wang Hip, Peninsular Siam.

41. RHINOLOPHUS MACROTIS SIAMENSIS Gyldenst.

Rhinolophus macrotis siamensis, Gyldenstolpe. Kungl. Sv. Vetenskapsakad. Handl. Bd. 57. No. 2. 1917, p. 12. (Doi Par Sakeng, N. W. Siam).

Only two specimens of this form have been collected, both having been obtained at Doi Par Sakeng, a mountain situated in North-western Siam near the Burmese boundary.

42. RHINOLOPHUS PUSILLUS Temm.

Rhinolophus pusillus, Temm. Monogr. Mamm. II, 1835, pl. 29, fig. 8; pl. 32, figs. 22-23. (Java).

Recorded from Siam under the name of *R. minor* Horsfield. Specimens obtained at Koh Lak in South-western Siam and at Jalor in Peninsular Siam.

43. RHINOLOPHUS ROBINSONI K. And.

Rhinolophus robinsoni, K. Andersen. Ann. & Mag. Nat. Hist. (9) 11. 1918, p. 375. (Khao Nawng, Bandon, Peninsular Siam).

This newly described species was obtained at Khao Kawng, Bandon, Peninsular Siam and was recorded under the name *R. borneensis* by Robinson & Kloss in their account of the Bandon collection (*vide* Journ. F. M. S. Mus. V. 1915, p. 116).

44. RHINOLOPHUS MALAYANUS Bonh.

Rhinolophus malayanus, Bonhote. Fascic. Malayensis Zool. Part I. 1903, p. 15.

Besides the type locality, this form has hitherto only been obtained at Koh Lak in South-western Siam.

45. RHINOLOPHUS AFFINIS SUPERANS K. And.

Rhinolophus affinis superans, K. Andersen. P. Z. S. 1905, II, p. 104. (Raheng).

Andersen mentions specimens from Trang in Peninsular Siam, and Bonhote records it from Jalor, in the same part of the country. According to Pousargues it inhabits "Siam."

46. HIPPOSIDEROS ARMIGER (Hodgs.).

Rhinolophus armiger, Hodgson. Journ. Asiat. Soc. Bengal, IV, 1835, p. 699. (Nepal).

Specimens of the typical form have been recorded from North-western Siam (Doi Par Sakeng and Nong Bea). It has also been recorded from Chantabun in South-eastern Siam and from Jalor in Peninsular Siam. The specimens from the southern localities may, however, belong to the race described by Andersen under the name *H. armiger debilis* (Ann. & Mag. Nat. Hist. (7) XVII, 1916, p. 37).

47. HIPPOSIDEROS LYLEI Thos.

Hipposideros lylei, Thomas. Ann. & Mag. Nat. Hist. (8) XII, 1913, p. 88. (Chiengdao Cave, Northern Siam).

This species has hitherto only been obtained at the type locality, but it probably inhabits the whole of Northern Siam.

48. HIPPOSIDEROS DIADEMA VICARIUS K. And.

Hipposideros diadema vicarius, K. Andersen. Ann. & Mag. Nat. Hist. (7) XVI, 1905, p. 499. (Niah Cave, Sarawak).

Authentic specimens of this race have been collected at Bang Nara, Patani, Peninsular Siam. The specimens mentioned by Bonhote from Biserat, Jalor (Patani), and by Flower from Bangkok, certainly belong to this same form.

49. HIPPOSIDEROS GENTILIS SINENSIS K. And.

Hipposideros gentilis sinensis, K. Andersen. Ann. & Mag. Nat. Hist. (9) II, 1918, p. 381. (Foochow, Fokien, China.)

Newly described by Andersen and recorded by him from Siam. Specimens collected at Chiangmai, Northern Siam by the present

author, and formerly referred to *Hipposideros bicolor* Temm., belong to this new subspecies.

50. *HIPPOSIDEROS GENTILIS ATROX* K. And.

Hipposideros gentilis atrox, K. Andersen. Ann. & Mag. Nat. Hist. (9) 11, 1918, p. 38. (Semangko Gap, Selangor).

This form has quite recently been described by Anderson on specimens from the Malay Peninsula, and it occurs in South-western and Peninsular Siam. The specimen collected by myself at Koh Lak was referred to *H. bicolor* Temm.

51. *HIPPOSIDEROS BICOLOR* Temm.

Hipposideros bicolor, Temm. Monogr. Mamm. 11, 1835, p. 18. (Java).

Found in Peninsular Siam where specimens have been recorded from Bang Nara, Patani and Jalor.

52. *HIPPOSIDEROS LARVATUS* (Horsf.).

Rhinolophus larvatus, Horsfield. Zool. Res. in Java, 1824. (Java).

Obtained at Jalor, Patani; also recorded from "Siam" by Flower and Pousarges.

53. *COELOPS FRITHII* Blyth.

Coelops frithii, Blyth. Journ. Asiat. Soc. Bengal. XVII, pl. I, 1848, p. 251. (Sundarbans, Bengal).

Authentic specimens have been collected at Chiengmai in Northern Siam. Recorded from "Siam" by Flower and from "Laos" by Pousarges.

54. *COELOPS ROBINSONI* Bonh.

Coelops robinsoni, Bonhôte. Journ. F. M. S. Mus. III, 1908, p. 4. (Gunong Tahan).

Only recorded from Khao Nawng, Bandon, Peninsular Siam.

55. *MEGADERMA SPASMA MINUS* K. And.

Megaderma spasma minus, K. Anderson. Ann. & Mag. Nat. Hist. (9) 11, 1918, p. 348. (Cambodia).

Obtained at Sukhothai in Northern Siam, but mentioned by Flower and Pousarges from "Siam" and "Laos" under the name of *Megaderma spasma*.

56. *PETALIA TRAGATA* K. And.

Petalia tragata, K. Anderson. Ann. & Mag. Nat. Hist. (8) X, 1912, p. 546. (Sarawak).

Recorded from Biserat and Jalor in Peninsular Siam.

57. *EPTESICUS PACHYOTIS* (Dobs.).

Vesperugo (*Vesperus*) *pachyotis*, Dobson. Proc. Asiat. Soc. Bengal, 1871, p. 213. (Khasia Hills).

Apparently confined to North-western Siam, where specimens have been obtained at Doi Par Sakeng.

58. *EPTESICUS DIMISSUS* Thos.

Eptesicus dimissus, Thomas. Journ. F. M. S. Mus. VII, 1916, p. 1, (Khao Nawng, Bandon, Peninsular Siam).

Hitherto only obtained from the type locality.

59. *TYLONYCTERIS FULVIDUS* (Blyth).

Scotophilus fulvidus, Blyth. Journ. Asiat. Soc. Bengal, XXVIII, 1859, p. 293. (Shwegyen, Burma).

Obtained in North-western Siam among the mountains known as Doi Vieng Par.

60. *TYLONYCTERIS ROBUSTULA* Thos.

Tylonycteris robustula, Thomas. Ann. & Mag. Nat. Hist. (8) XV, 1915, p. 227. (Upper Sarawak, Borneo).

Originally described from Borneo, but also obtained at Doi Par Sakeng in North-western Siam.

61. *PIPISTRELLUS COROMANDRA* (Gray).

Scotophilus coromandra, Gray. Mag. Zool. & Bot. II, 1838, p. 498. (India).

Recorded from Nan in Northern Siam (under the name of *Pipistrellus abramus* Temm.), as well as from Biserat and Jalor in Peninsular Siam, so this species seems to be distributed throughout the country.

62. *HESPEROPTENUS BLANFORDI* Dobs.

Vesperugo (*Hesperoptenus*) *blanfordi*, Dobson. Journ. Asiat. Soc. Bengal, 1877, pt. 2, p. 312. (Tenasserim).

Hitherto only recorded from Khao Nawng, Bandon, Peninsular Siam.

63. *GLISCHROPUS TYLOPUS* Dobs.

Vesperugo (*Glischropus*) *tylopus*, Dobson. P. Z. S. 1875, p. 473. (N. Borneo).

Nothing is known about the occurrence of this bat in Siam

except that some specimens were obtained at Biserat and Jalor in Peninsular Siam.

64. *SCOTOPHILUS KUHLLI* Leach.

Scotophilus kuhlii, Leach. Trans. Linn. Soc. XIII, 1822, p. 71.
(India?).

Apparently distributed throughout the whole country, as specimens have been collected in Northern as well as in Peninsular Siam.

65. *SCOTOPHILUS BELANGERI* (Is. Geoff.).

Vespertilio belangeri, Is. Geoff. in Bélanger, Voy. Zool. 1834, p. 87,
pl. 3. (Pondichery, India).

According to Kloss (Journ. N. H. Soc. Siam, II, 1917, p. 301) this species has been obtained at Bangkok.

66. *SCOTOPHILUS CASTENUS* (Horsf.).

Nycticejus castaneus, Horsfield. Cat. Mamm. E. Ind. Coll. 1851,
p. 38. (Malacca).

Occurs throughout the whole country, specimens having been collected near Chiengmai, Northern Siam, as well as in Patani and Jalor, Peninsular Siam.

67. *SCOTOPHILUS GAIRDNERI* Kloss.

Scotophilus gairdneri, Kloss. Journ. Nat. Hist. Soc. Siam, II, 1917,
p. 284. (Paksampo, Central Siam).

Only known from the type specimen.

68. *LEUCONOE ADVERSUS* (Horsf.).

Vespertilio adversus, Horsfield. Zool. Res. in Java, 1824. (Java).

Mentioned from "Siam" by Flower and Pousargès, but no recent specimens have been collected.

69. *LEUCONOE HASSELTII* (Temm.).

Vespertilio hasseltii, Temm. Monogr. Mamm. II, 1835, p. 225. (Java).

According to Blanford (Fauna of British India, Mammalia) this species also inhabits Siam.

70. *MYOTIS MURICOLA* (Hodgs.).

Vespertilio muricola, Hodgson in. Gray, Cat. Mamm. Nep. Thib. 1846, p. 4. (Nepal).

Apparently common throughout the whole country, especially in the southern districts, as it has been recorded from Bandon, Nawngchik

and Jalor in Peninsular Siam. Pousargès also states that it inhabits the Laos country.

71. *MYOTIS EMARGINATUS* (Geoffr.).

Vespertilio emarginatus, Geoffr. Ann. du Muséum, VIII, 1906, p. 198.

Bonhôte mentions this species as occurring in Biserat and Jalor, Peninsular Siam, but no recent specimens have been obtained in Siamese territory.

72. *KERIVOULA PICTA* (Pall.).

Vespertilio pictum, Pallas. Spicil. Zool. Fasc. III, p. 7. (Ceylon).

Obtained at Klong Rangsit, in Central Siam, according to Flower.

73. *KERIVOULA HARDWICKII* (Horsf.).

Vespertilio hardwickii, Horsfield. Zool. Res. in Java, 1824. (Java).

Hitherto only recorded from North-western Siam, where specimens have been collected at Hue Muang.

74. *KERIVOULA MINUTA* Miller.

Kerivoula minuta, Miller. Proc. Acad. Nat. Sci. Philad. vol. 50, 1898, p. 321. (Trang, Peninsular Siam).

A southern form and at present only known from the type locality.

75. *KERIVOULA BICOLOR* Thos.

Kerivoula bicolor, Thomas. Ann. & Mag. Nat. Hist. (7) XIV, 1904, p. 199. (Biserat, Jalor).

Hitherto only recorded from Peninsular Siam.

76. *PHONISCUS ATROX* Miller.

Phoniscus atrox, Miller. Proc. Biol. Soc. Wash. XVIII, 1905, p. 229. (Kateman river, W. Sumatra).

Originally described from Sumatra, but a single specimen obtained at Klong Bang Lai, Patiyu, Peninsular Siam.

77. *MINIOPTERUS MEDIUS* Thos. & Wrought.

Miniopterus medius, Thomas & Wroughton. P. Z. S. 1909, p. 382. (Kalipoetjang, W. Java).

In Siam this bat has only been met with on the Island of Terutau, on the west coast of Peninsular Siam.

78. *EMBALLONURA MONTICOLA* Temm.

Emballonura monticola, Temm. Tijl. Natuurl. Geschied, V, 1839, p. 25, pl. II, figs. 1-2. (Munara Mts, Java).

Obtained at Khao Nawng, Bandon, Peninsular Siam.

79. *EMBALLONURA PENINSULARIS* Miller.

Emballonura peninsularis, Miller, Proc. Acad. Nat. Sci. Philad. 1898, p. 323. (Trang, Peninsular Siam.)

Inhabits Peninsular Siam, where specimens have been obtained at Trang, and at Khao Nawng in the district of Bandon.

80. *TAPHOZOUS MELANOPOGON* Temm.

Taphozous melanopogon, Temm. Monogr. Mamm. II, 1835, p. 287. (Java).

Pousarges records it from "Siam", and Flower obtained it at Bangkok, and at Chantabun, South-eastern Siam.

81. *TAPHOZOUS MELANOPOGON FRETENSIS* Thos.

Taphozous melanopogon fretensis, Thos. Journ. F. M. S. Mus. VII, 1916, p. 5. (Terutau Island).

An Island race found on the Islands of Terutau and Langkawi on the west coast of Peninsular Siam.

82. *TAPHOZOUS LEUCOPLEURUS ALBIPINNIS* Thos.

Taphozous longimanus albipinnis, Thomas, Ann. & Mag. Nat. Hist (7) II, 1898, p. 246. (Labuan.)

Hitherto only obtained at Jalor in Peninsular Siam.

83. *CHEIROMELES TORQUATUS* Horsf.

Cheiromeles torquatus, Horsfield, Zool Res. in Java. 1824. (Java).

Found on Pulau Terutau, Peninsular Siam, and also recorded by Flower as inhabiting "Siam." *

* The following species of bats are also mentioned by Pousarges (Mission Pavie. Etudes diverses: Recherches sur l'Histoire Naturelle de l'Indo-Chine Orientale, III. Paris, 1904.) as inhabiting Siam, but as no recent specimens have been collected their occurrence within Siamese territory seems doubtful:—

Rhinolophus acuminatus Peters.....Siam, Laos.
Tylonycteris pachypus Temm.....Siam, Laos.
Harpiocephalus cyclotis Dobs.....S. Siam.
Chaerephon plicatus Buch. Ham.....Siam, Laos.

ORDER INSECTIVORA.

SUBORDER DERMOPTERA.

84. GALEOPTERUS TEMMINCKI PENINSULAE THOS.

Galeopterus peninsulae, Thomas. Ann. & Mag. Nat. Hist. (8) II, 1908, p. 303. (Semangko Pass, Selangor-Pahang boundary).

The Malayan race of the Flying Lemur only inhabits Southern and Peninsular Siam, where it is not uncommon; specimens have been collected at Patelung, Bandon and Bang Nara. Gairdner has also met with it in Ratburi, west of Bangkok, but its northern limits are still unknown.

85. GALEOPTERUS TEMMINCKI PUMILUS (Miller).

Galeopithecus pumilus, Miller. Smiths. Misc. Coll., vol. 45, 1903, p. 46. (Pulan Adang, Butang Islands, off the western coast of Peninsular Siam).

Exclusively found in the type locality, where it seems to be rather rare.

SUBORDER INSECTIVORA VERA.

86. DENDROGALE FRENATA (Gray).

Tupaia frenata, Gray. Ann. & Mag. Nat. Hist. (3) VI, 1860, p. 217. (Cambodia).

Hitherto only recorded from South-eastern Siam, where Kloss obtained specimens at Klong Yai and Klong Menao on the Franco-Siamese boundary.

87. TUPAIA BELANGERI BELANGERI (Wagn.).

Cladobates belangeri, Wagner in Schrebers Säugetiere, Suppl. II, 1841, p. 42. (Sittirram, Burma).

Inhabits Central, South-eastern, Southern and Peninsular Siam, where it is quite common.

88. TUPAIA BELANGERI LAOTUM THOS.

Tupaia belangeri laotum, Thomas. Ann. & Mag. Nat. Hist. (8) XIII, 1914, p. 244. (Nan, Northern Siam).

Apparently distributed throughout Northern Siam. Specimens recorded from Chiangmai and Koon Tan, besides those from the type locality.

89. *TUPAIA CHINENSIS* Anders.

Tupaia chinensis, Anderson, Zool. Res. Western Yunnan Exp. 1879, p. 129. (Ponsee, Kakyen Hills).

Lyon, in this Monograph of the Tupaiidae, records specimens from Chiengmai, Nan and Muang Pai in Northern Siam. Southwards it extends at least as far as Raheng in Central Siam.

90. *TUPAIA SIAMENSIS* Gyldenst.

Tupaia siamensis, Gyldenstolpe, Kungl. Sv. Vetenskapsakad. Handl. Bd. 57, No. 2, 1917, p. 20. (Koh Lak, S. W. Siam).

Only known from the mountain regions westwards from Koh Lak in South-western Siam.

91. *TUPAIA CONCOLOR CONCOLOR* Bonh.

Tupaia concolor, Bonhote. Abstr. P. Z. S. 1907, p. 2. (Nha Trang, Annam).

Inhabits South-eastern Siam, where specimens have been collected at Ok Yam, Klong Yai and Klong Menao.

92. *TUPAIA CONCOLOR SINUS* Kloss.

Tupaia concolor sinus, Kloss. P. Z. S. 1916, p. 36. (Koh Chang).

An Island race inhabiting Koh Chang, off the coast of South-eastern Siam.

93. *TUPAIA GLIS WILKINSONI* Rob. & Kloss.

Tupaia ferruginea wilkinsoni, Robinson & Kloss, Journ. F. M. S. Mus. IV, 1911, p. 173. (Ko-khao, Trang, Peninsular Siam).

Found in Peninsular and South-western Siam north to Ratburi.

94. *TUPAIA FERRUGINEA ULTIMA* Rob. & Kloss.

Tupaia ferruginea ultima, Robinson & Kloss, Ann. & Mag. Nat. Hist. (8) XIII, 1914, p. 234. (Koh Pennan).

Inhabits the Island of Koh Pennan, off the eastern coast of Peninsular Siam.

95. *TUPAIA FERRUGINEA OPEROSA* Rob. & Kloss.

Tupaia ferruginea operosa, Robinson & Kloss, Ann. & Mag. Nat. Hist. (8) XIII, 1914, p. 233. (Koh Samui).

Obtained on the Island of Koh Samui, off the eastern coast of Peninsular Siam.

96. *TUPAIA LACERNATA* Thos. & Wrought.

Tupaia lacernata, Thomas & Wroughton, Ann. & Mag. Nat. Hist. (8) IV, 1909, p. 535. (Palau Langkawi).

Also found on the adjacent Island of Terutau, on the western coast of Peninsular Siam.

97. *TUPAIA LACERNATA RAWIANA* Lyon.

Tupaia variana, Lyon, Proc. Biol. Soc. Wash. XXIV, 1911, p. 167. (Pulau Rawi).

Originally described from Pulau Rawi, but also found on Pulau Adang, another of the Butang Islands, off the western coast of Peninsular Siam.

98. *GYMNURA GYMNURA MINOR* Lyon.

Gymnura gymnura minor, Lyon, Proc. U. S. Nat. Mus. XXXVI, 1909, p. 453. pls. 34, fig. I. & 35, fig. I. (Khao Nok Ram, Trang, Peninsular Siam).

Originally described from Trang but also obtained at Bang Nara, Patani, also in Peninsular Siam, Northern limits unknown.

99. *HYLOMYS SIAMENSIS* Kloss.

Hylomys siamensis, Kloss, Journ. Nat. Hist. Soc. Siam, II, 1916, p. 10. (Hinlap, Eastern Siam).

Only known from the type specimen.

100. *PACHYURA MURINA* (Linn.).

Sorex murinus, Linnaeus, Syst. Nat. I. 1766, p. 75. (Java).

Recorded from Bangkok by Flower, but nothing else known about its occurrence in Siam.

101. *PACHYURA MALAYANA* Kloss.

Pachyura malayana, Kloss, Journ. Nat. Hist. Soc. Siam, II, 1917, p. 282. (Bang Nara, Patani, Peninsular Siam).

Apparently a southern form but hitherto only obtained in the type locality.

102. *CROCIDURA FULIGINOSA* (Blyth).

Sorex fuliginosus, Blyth, Journ. Asiat. Soc. Bengal, XXIV, 1855, p. 362. (Shwegyen, Burma).

Only recorded from Jalor, Patani, Peninsular Siam.

103. *CROCIDURA AAGAARDI* Kloss.

Crocidura aagaardi, Kloss, Journ. Nat. Hist. Soc. Siam, II, 1917, p. 283. (Bang Nara, Patani, Peninsular Siam).

Besides the type specimen, it has only been met with and recorded from Biserat, also in Peninsular Siam (under the name of *Soriculus nigrescens*), in Bonhote's paper in the Proc. Zool. Soc 1900, p. 874.

104. *CROCIDURA NEGLIGENS* Rob. & Kloss.

Crocidura negligens, Robinson & Kloss. Ann. & Mag. Nat. Hist. (8) XIII. 1914, p. 232. (Koh Samui).

Inhabits Koh Samui, off the eastern coast of Peninsular Siam.

105. *PARASCAPTOR LEUCURA* (Blyth).

Talpa leucura, Blyth, Journ. Asiat. Soc. Bengal XIX. 1850, p. 215. pl. IV. figs. I—Ia. (Cherra + unji).

Record from Western Siam by Pousarges, and recently obtained by Mr. Eisenhofer at Doi Nga Chung, south-east of Chiangmai in Northern Siam.

ORDER CARNIVORA.

106. *ARCTICONUS THIBETANUS* (Cuv.).

Ursus thibetanus, Cuv. Hist. Nat. Mamm. 1821. pl. 213.

Though very little is known about the distribution of this bear in Siam, it seems to occur in the mountain regions of the whole country extending southwards at least to Ratburi. Also recorded from near Sisophon, Cambodia. Most common in the northern parts.

107. *HELARCTOS MALAYANUS* (Raffles).

Ursus malayanus, Raffles. Trans. Linn. Soc. XIII. 1822. p. 254. (Sumatra).

Apparently rather common in suitable localities throughout the country, especially in the southern districts.

108. *MELURSUS URSINUS* (Shaw).

Bradypus ursinus, Shaw. Naturalist's Miscellany, II. 179¹, pl. 58. (India).

The occurrence of the Sloth Bear in Siam is very doubtful, but Flower mentions it from the Laos country and from the Bangpakong river, the latter, however, with some reservation.

109. *ARCTONYX DICTATOR* Thos.

Arctonyx dictator, Thomas. Ann. & Mag. Nat. Hist. (8) V. 1910. p. 424. (Trang, Peninsular Siam).

Apparently distributed throughout the whole country but most common in the southern parts, where specimens have been collected at various places such as Klong Wang Hip, Lamra (Trang), north through South-west Siam (Sai Yoke, Si-sa-wad) to Raheng. It has also been obtained near Sisophon, Cambodia, and Pousarges records a

Hog-badger from Northern Siam under the name of *A. collaris*, viz., the northern form.

110. *HELICHTIS PERSONATA* (Geoff.).

Melogale personata, Geoff. in Bélanger, Voy. Zool. 1834, p. 137, pl. V. (Rangoon, Burma).

An inhabitant of Northern Siam, but very little is known about its occurrence and distribution in Siam. Specimens recorded from Nan and Chiengmai.

111. *MARTES FLAVIGULA FLAVIGULA* (Bodd.).

Mustela flavigula, Boddaert, Elench. Anim. 1785, p. 88. (Nepal).

The large typical race of the Indian Marten inhabits Northern Siam, specimens having been collected at Chiengmai, Doi Par Sakeng and Doi Vieng Par. To the south it is replaced by the allied races mentioned below.

112. *MARTES FLAVIGULA PENINSULARIS* (Bonh.).

Mustela flavigula peninsularis, Bonhote, Ann. & Mag. Nat. Hist. (7) VII, 1901, p. 346. (Bankachon, S. Tenasserim).

Inhabits Southern and Peninsular Siam, but northern limits unknown.

113. *MARTES FLAVIGULA INDOCHINENSIS* Kloss.

Martes flavigula indochinensis, Kloss, P. Z. S. 1916, p. 35. (Klong Menao, S.E. Siam).

Originally described from South-eastern Siam, but apparently distributed throughout the whole eastern part of the country where specimens have been collected at Lat Bua Kao.

114. *LUTRA BARANG* Cuv.

Lutra barang, F. Cuv, Diet. Sci. Nat. XXVII, 1823, p. 246. (Java).

Otters are not common in Siam and very little is known about their distribution. This species has been met with in Northern Siam (near Chiengsen), in North-western Siam (Meh Lua), near Bangkok, and in the district of Patelung in Peninsular Siam. Hence it seems to occur in the whole country.

115. *LUTRA SUMATRANA* (Gray).

Barangia sumatrana, Gray, P. Z. S. 1865, p. 123. (Sumatra).

As far as I know this species has hitherto only been obtained a few times in Peninsular Siam.

116. AONYX CINEREA (Illiger).

Lutra cinerea, Illiger, Abh. Akad. Berlin, 1811 (published 1815), p. 99. (Java).

The Small Clawless Otter, which is fairly common in the Malay Peninsula, has also been obtained a few times in Peninsular Siam, viz., at Patelung and Nawngchik.

117. THOS AUREUS CRUESEMANNI (Matschie).

Canis cruesemanni, Matschie, S. B. Gesch. Naturforsch. Berlin, 1900. p. 145. (Nong Bua, E. Siam).

The distribution and the occurrence of Jackals in Siam is still very imperfectly known and very few specimens have ever been collected. It seems to be rather rare and has only been observed by a few naturalists, and never in the Northern parts of the country. Recorded from South-western Siam (Ratburi and Hat Sanuk) and is said to occur in Muang Pran, but everywhere very rare.

118. CUON RUTILANS (S. Müll.).

Canis rutilans, S. Müll. Verhandl. Zool. Zoogd. 1839. pp. 27 & 51.

The wild Dog seems to be widely distributed in Siam though still imperfectly known. It seems, however, to be most common in the southern parts of the country, though it also occurs in the North.

119. VIVERRA ZIBETHA PRUINOSA (Wrought.).

Viverra zibetha pruinosa, Wroughton. Journ. Bombay Nat. Hist. Soc. XXIV, 1915. p. 64. (Thaget, Little Tenasserim river).

Inhabits Southern and Peninsular Siam at least north to Ratburi. It seems to be rather common, but it is uncertain if it also occurs in Northern Siam.

120. VIVERRA MEGASPILA Blyth.

Viverra megaspila, Blyth, Journ. Asiat. Soc. Bengal. XXXI. 1862. p. 331. (Burma).

The Burmese Civet occurs throughout Siam; it has been reported from Khao Pleung in the north as well as from Hat Sanuk in the south. It is, however, not so common as the other Civet.

121. VIVERRICULA MALACCENSIS (Gün.).

Viverra malaccensis, Gmelin, in Linn. Syst. Nat. I. 1788. p. 92. (Malaysia).

Confined to the southernmost parts of the country and apparently rare, as it has only been obtained in Siam at Patani.

122. LINSANG MACULOSUS (Blanf.).

Prionodon maculosus, Blanford, Proc. Asiat. Soc. Bengal, 1878 p. 71.
(Tenasserim).

Hitherto only recorded from the Province of Ratburi, according to Gairdner.

123. HEMIGALUS DERBIANUS INCURSOR Thos.

Hemigalus derbianus incurzor, Thomas, Journ. Bombay Nat. His. Soc. XXIII, 1915 p. 613, (Bankachon, S. Tenasserim).

Obtained at Trang in Peninsular Siam.

124. ARCTOGALIDIA LEUCOTIS (Horsf.).

Paradoxurus leucotis, Horsfield, Cat. East Ind. Mus. 1851. p. 66.

Still imperfectly known, but obtained in the Dong Phya Fai in Eastern Siam, according to Flower.

125. ARCTOGALIDIA MAJOR Miller.

Arctogalidia major, Miller, Proc. Biol. Soc. Wash. XIX, 1906, p. 25.
(Trang, Peninsular Siam);

Known from the type locality only.

126. PARADOXURUS HERMAPHRODITUS LAOTUM Gyldenst.

Paradoxurus hermaphroditus laotum, Gyldenstolpe, Kungl. Sv. Vetenskapskad. Handl. Bd. 57, No. 2, 1917, p. 26. (Chienghai, N. Siam).

Inhabits Northern Siam, being replaced in the south by allied races.*

127. PARADOXURUS HERMAPHRODITUS RAVUS Miller.

Paradoxurus hermaphroditus rarus, Miller, Smiths. Misc. Coll. vol. 61, No. 21, 1913, p. 2. (Trang, Peninsular Siam).

A southern form inhabiting Southern, Peninsular and Central Siam, where it is quite common everywhere. Also found on the Islands of Koh Chang, Gulf of Siam, and Salanga (Puket), on the west coast of Peninsular Siam, but whether this or allied subspecies is uncertain.

* In the Journal of the Bombay Natural History Society, Vol. XXV, 1917, p. 51, Wroughton described a Palm Civet from Upper Burma under the name of *Paradoxurus birmanicus*. This form is, however, absolutely identical with *P. hermaphroditus laotum* Mihi., and as this form was described some months earlier, Wroughton's name becomes a synonym of that species.

128. PARADOXURUS HERMAPHRODITUS CANUS Miller.

Paradoxurus hermaphroditus canus, Miller. Smiths. Misc. Coll. vol. 61. No. 21. 1913. p. 5 (Pulau Terutau).

A slightly differentiated race inhabiting the Island of Terutau, on the western side of Peninsular Siam.

129. PARADOXURUS MINOR MINOR Bonh.

Paradoxurus minor, Benhote. Fasc. Malayenses Zool. Part 1. 1903. p. 2. (Jalor).

Originally described from Jalor, Patani, but also found on the Islands of Koh Samui and Koh Penman, off the eastern coast of Peninsular Siam.

130. PARADOXURUS MINOR KUTENSIS Kloss.

Paradoxurus minor kutensis, Kloss. P.Z.S. 19.6. p. 34. (Koh Kut).

An Island race inhabiting Koh Kut in the Gulf of Siam.

131. PAGUMA LEUCOMYSTAX ROBUSTUS (Miller).

Paradoxurus robustus, Miller. Proc. Biol. Soc. Wash. XIX. 1906. p. 26. (Trang, Peninsular Siam).

Inhabits Southern and Peninsular Siam. Specimens recorded from Nawngchik, Patani, Ban Koh Klap (Bandon) and Klong Wang Hip (Tung Song), besides those from the type locality.

132. ARCTICTIS BINTURONG BINTURONG (Raffl.).

Tierrra binturong, Raffles. Trans. Linn. Soc. XIII. 1821. p. 233. (Malacca).

Specimens of the typical race of the Binturong have been recorded from Prachin in Central Siam. Otherwise nothing is known about its distribution in the country, where it seems to be rare.

133. ARCTICTIS GAIRDNERI Thos.

Arctictis gairdneri, Thomas. Ann. & Mag. Nat. Hist. (8) XVII. 1916. p. 270. (Sai Yoke, S. W. Siam).

This species has been described on a specimen collected by Gairdner at Sai Yoke in South-western Siam. It is distinguished from the typical form by its large size, but nothing is recorded about its distribution in the country.

134. MUNGOS SIAMENSIS Kloss.

Mungos siamensis, Kloss. Journ. Nat. Hist. Soc. Siam II. 1917. p. 215. (Muang Prae, N. Siam).

Specimens recorded from Lat Bua Kao in Eastern Siam, besides the type specimen. It seems, therefore, to inhabit Northern as well as Eastern Siam, but its southern limits are not known.

135. MUNGOS EXILIS PENINSULAE Schwarz.

Mungos exilis peninsulae, Schwarz. Ann. & Mag. Nat. Hist. (8) VI. 1910. p. 231. (Bangkok).

Recorded from Nan in Northern Siam as well as from several localities in the southern parts of the country, (Biserat, Jalor and Patani). As it is also found west of the Chao Praya river, it seems to occur throughout the whole country.

136. MUNGOS URVA (Hodgs.).

Gulo urva, Hodgson. Journ. Asiat. Soc. Bengal, V. 1836. p. 238. (Himalayas.)

The Crab-Eating Mongoose is very common in South-western Siam, as, for instance, at Hat Sanuk near the Siam-Tenasserim boundary, and it has also been reported from Prachai in Eastern Siam.

137. FELIS CHAUS AFFINIS Gray.

Felis affinis, Gray. Ill. Ind. Zool. I. pl. 3. 1830. (Gangootra).

Flower records it from "Siam" and Gairdner has met with it in the Province of Ratburi.

138. FELIS DOMESTICA Briss.

Felis domestica, Brisson. Quadrup. p. 191.

The Domestic House-Cat is commonly distributed in Siam.

139. PANTHERA TIGRIS (Linn.).

Felis tigris, Linn. Syst. Nat. I. 1766. p. 41. (Asia).

Common in suitable localities throughout the country, both on the plains and in the mountains.

140. PANTHERA PARDUS VARIEGATA (Wagn.).

Felis pardus var. *variegata*, Wagner in Schreb. Säuget. II. 1841. p. 483.

The Leopard is quite common over the whole country, even in the neighbourhood of towns and villages. The melanistic variety called the Black Panther seems to be more common in the Southern districts than in the north.

141. *NEOFELIS NEBULOSA* (Griffith).

Felis nebulosa, Griffith, Descript. Vert. 1821, p. 37.

The Clouded Leopard seems to be fairly common in the mountain forests of Northern Siam, but its distribution is still imperfectly known. Specimens have, however, been shot at Pa Hing, Pak Koh, and in the neighbourhood of Chiengmai.

142. *PROFELIS TEMMINCKII* (Vig. & Horsf.).

Felis temminckii, Vig. & Horsf. Zool. Journ. 111. 1828. p. 451. (Sumatra).

The Golden Cat occurs throughout Northern and Central Siam, but its habits and distribution are almost unknown. In Siam specimens have been obtained in the neighbourhood of Chiengmai, at Pa Hing, and Raheng down to Ratburi, but it always seems to be rare.

143. *ZIBETHAILURUS VIVERRINA* (Benn.).

Felis viverrina, Bennett, P. Z. S. 1833. p. 68. (India).

Recorded from Paknam Krabin and Ratburi, Central Siam.

144. *PRIONAILURUS BENGALENSIS* (Kerr).

Felis bengalensis, Kerr. Animal Kingdom, 1792. p. 151.

The Leopard Cat apparently occurs throughout Siam. Specimens have been collected at Sakerat (Eastern Siam.), Tachin (Central Siam), Ratburi (S. W. Siam) and Kampong Jalor and Patelung (Peninsular Siam.)

145. *AILURUS PLANICEPS* (Vig. & Horsf.).

Felis planiceps, Vig. & Horsf. Zool. Journ. III. 1828. p. 450, pl. XII. (Sumatra).

A southern form hitherto only recorded from Bang Nara, Patani, Peninsular Siam.

ORDER RODENTIA.

146. *PETAURISTA PETAURISTA MELANOTUS* (Gray).

Pteromys melanotus, Gray. Mag. Nat. Hist. New series, I. 1837. p. 584. (Malay Peninsula).

Peninsular and Central Siam. Apparently not common.

147. *PETAURISTA PETAURISTA TERUTAUS* Lyon.

Petaurista terutaus, Lyon. Proc. Biol. Soc. Wash. XX. 1907. p. 17. (Pulan Terutan).

A slightly differentiated race found on the Island of Terutan.

148. *PETAURISTA PETAURISTA LYLEI* Bonh.

Petaurista lylei, Bonhote, P. Z. S. 1900. p. 192. pl. XVIII. (Doi Sutep, N. Siam).

Apparently the most common of the Large Flying Squirrels inhabiting Siam. Especially abundant in the North, where specimens have been obtained at Utaradit, north of Muang Prae, Pak Koh and Koon Tan, besides at the type locality.

149. *PETAURISTA PETAURISTA CICUR* Rob. & Kloss.

Petaurista nitida cicur, Robinson & Kloss. Ann. & Mag. Nat. Hist. (8) XIII. 1914. p. 223. (Ban Kok Klap, Bandon, Peninsular Siam).

Replaces the foregoing species in Peninsular and Southern Siam. Also recorded from Klong Wang Hip, Tung Song.

150. *PETAURISTA ANNAMENSIS BARRONI* Kloss.

Petaurista annamensis barroni, Kloss. Journ. Nat. Hist. Soc. Siam 11. 1916. p. 33. (Hup Bon, S. E. Siam).

Hitherto recorded from South-eastern and Central Siam (Pu Khao Sammün and the Nampat District in the Monthon of Pit-sanulok).

151. *SCIUROPTERUS ALBONIGER* Hodgs.

Sciuropterus alboniger, Hodgson. Journ. Asiat. Soc. Bengal V. 1836. p. 231. (Nepal)

Mentioned from "Siam" and "Laos" by Flower and Pousarges, but as no recent specimens have been collected, its distribution is still uncertain.

152. *HYLOPETES PHAYREI LAOTUM* (Thos.).

Sciuropterus phayrei laotum, Thomas, Journ. Bombay Nat. Hist. Soc XXIII. 1914 p. 28. (Laos mountains and N. Siam).

Apparently an inhabitant of Northern Siam where specimens have been obtained at Nan. Bonhote records a specimen from Biserat in Jalor under the name of *Sciuropterus phayrei* (P. Z. S. 1900. p. 876, but whether it is this or an allied form is uncertain.

153. *HYLOPETES BELONE* (Thos.).

Sciuropterus belone, Thomas, Ann. & Mag. Nat. Hist. (8) 11. 1908. p. 305. (Pulan Terutan).

Hitherto only obtained on Terutan Island.

154. PETINOMYS PHIPSONI Thos.

Pteromys (Petinomys) phipsoni, Thomas. Journ. Bombay Nat. Hist. Soc. XXIV. 1916. p. 432. (Tenasserim Town).

This small Flying Squirrel has up to the present time only been collected at Bang Nara, Patani, Peninsular Siam.

155. LARISCUS INSIGNIS JALORENSIS (Bonh.).

Funambulus insignis jalorensis, Bonhote, Fase, Malayenses Zool, Part 1. 1903. p. 25. (Bukit Besar, Nawnggehik).*

A southern form inhabiting Peninsular Siam where specimens have been collected at Kao Nawng, Kao Wang Hip, etc.

156. RHINOSCIURUS TUPAIODES Blyth.

Rhinosciurus tupaoides, Blyth, Journ Asiat. Soc. Bengal, XXIV. 1855. p. 477. (Singapore).

Inhabits Southern and Peninsular Siam. Specimens recorded from Kao Nawng, Ban Koh Klap and Bang Nara.

157. MENETES BERDMOREI MOUHOTII Gray.

Sciurus mouhotii, Gray, P. Z. S. 1861. p. 137. (Cambodia)

This race of Berdmore's Squirrel inhabits South-eastern Siam where it is rather common. Specimens collected at Lem Ngop, Klong Menao, Klong Yai, Ok Yam and Khao Sebab.

158. MENETES BERDMOREI KORATENSIS Gyldenst.

Menetes berdmorei koratensis, Gyldenstolpe, Kungl. Sv. Vetenskaps-akad. Handl. Bd. 57. No. 2. 1917. p. 39. (Sakerat, E. Siam).

Inhabits the Korat plateau in Eastern Siam, and thus the districts north of the former race.

159. MENETES BERDMOREI CONSULARIS Thos.

Menetes berdmorei consularis Thomas, Journ. Bombay Nat. Hist. Soc. XXIII. 1914. p. 24. (Nan, N. Siam).

A northern race and common in Northern Siam where specimens have been obtained at several localities, viz. at Muang Prae, Muang Nan, Nam Phi, Sukhotai, Muang Prom above Antong, Koon Tan, Chum Poo, Vang Nun, etc.

* Gerrit Miller Jr. described in the Smiths. Misc. Coll. vol. 45. 1903. p. 25. a squirrel from Khaw Sai Dow, Trang under the name of *Funambulus peninsulæ*. This form is, however, absolutely identical with *F. insignis jalorensis* Bonh. and as Bonhote's description was published a few weeks earlier his name will stand by the laws of priority.

160. *MENETES BERDMOREI BERDMOREI* (Blyth).

Sciurus berdmorei, Blyth. Journ. Asiat. Soc. Bengal, XVIII. 1849. p. 603. (Thounggyen, Burma).

Specimens of the typical form of Berdmore's Squirrel have also been recorded from the following localities in Siam, viz., Ban Koh Klap (Bandon, Peninsular Siam), Klong Bang Lai (Patiyu, Peninsular Siam), Muang Prau (S. W. Siam), Krabin and Raheng (Central Siam). The specimens from Central Siam may, however, probably be referred to *M. b. consularis* Thos., but those collected in Peninsular and South-western Siam may possibly belong to the typical race, the range of which is given by Thomas to Rangoon, Martaban and neighbouring parts of Tenasserim, but before a careful examination of these specimens has been made no definite opinion of their relationship can be given.

161. *MENETES BERDMOREI UMBROSUS* Kloss.

Menetes berdmorei umbrosus, Kloss, P. Z. S. 1916. p. 49, (Koh Chang)

As Island race found on Koh Chang, off the coast of South-eastern Siam.

162. *MENETES BERDMOREI RUFESCENS* Kloss.

Menetes berdmorei rufescens, Kloss, P. Z. S. 1916. p. 50. (Koh Kut).

Another Island form, inhabiting Koh Kut, off the coast of South-eastern Siam.

163. *RATUFA GIGANTEA* McClell.

Sciurus giganteus, McClelland. P. Z. S. 1839. p. 150. (Assam).

The Indian form of the Giant Squirrel has been recorded from Nan in Northern Siam by Bonhote and is also mentioned from "Siam" by Pousarges, but its occurrence is still uncertain.

164. *RATUFA PHAEOPEPLA PHAEOPEPLA* Miller.

Ratufa phaeopepla, Miller. Smiths. Misc. Coll. vol. 61. No. 21. 1913. p. 25. (Sungei Balik, Tenasserim).

Recorded from Western Siam (Sai Yoke, Kanburi and Ratburi) as well as from Northern Siam (Muang Prae).

165. *RATUFA PHAEOPEPLA MARANA* Thos. & Wrought.

Ratufa phaeopepla marana, Thomas & Wroughton, Journ. Bombay Nat. Hist. Soc. XXIV. 1916. p. 227. (Mount Popa, Burma).

Hitherto only obtained in the mountain regions of Koon Tan and Pak Koh in Northern Siam.

166. RATUFA MELANOPEPLA PENINSULAE Miller.

Ratufa melanopepla peninsulae, Miller. Smiths. Misc. Coll. vol. 61. No 21. 1913, p. 25. (Lay Song Hong, Trang, Peninsular Siam).

A southern form confined to Peninsular Siam where specimens have been met with at Kao Nawng, Ban Koh Klap, Bang Nara, Biserat, Jalor and Talé-sap.

167. RATUFA MELANOPEPLA LEUCOGENYS Kloss.

Ratufa melanopepla leucogenys, Kloss. P. Z. S. 1916. p. 43. (Lem Ngop, S. E. Siam).

Apparently confined to South-eastern and Eastern Siam, extending into Central Siam east of the Chao Phya river. Besides the type locality, it has been collected at Phrabat, Hinlap, Sakerat, Sri-racha, Nong Khor, Krabin and Paknam Krabin.

168. RATUFA MELANOPEPLA FRETENSIS Thos. & Wrought.

Ratufa melanopepla fretensis, Thomas & Wroughton. Ann. & Mag. Nat. Hist. (8) IV. 1909. p. 535. (Pulau Langkawi).

Found on Pulau Terutau besides at the type locality.

169. RATUFA MELANOPEPLA DECOLORATA Rob. & Kloss.

Ratufa melanopepla decolorata, Robinson & Kloss. Ann. & Mag. Nat. Hist. (8) XIII. 1914. p. 227. (Koh Samui).

Confined to the Islands Koh Samui and Koh Pennan, where it is quite common.

170. RATUFA MELANOPEPLA SINUS Kloss.

Ratufa melanopepla sinus, Kloss. P.Z.S. 1916. p. 44. (Koh Kut).

Found on Koh Kut, off the coast of South-eastern Siam.

171. RATUFA AFFINIS AUREIVENTER (Geoff.).

Sciurus aureiventer, Is Geoffr. Guérin. Mag. Zool. 1832. (Malacca).

Peninsular Siam, where specimens have been collected at Bang Nara, Patani.

172. RATUFA PYRSONOTA Miller.

Ratufa pyrrsonota, Miller. Proc. Wash. Acad. 1900. p. 75. (Trang, Peninsular Siam).

Specimens recorded from Trang, Bang Nara and Khao Wang Hip, all places in Peninsular Siam.

173. *CALLOSCIURUS ERYTHRAEUS RUBECULUS* (Miller).

Sciurus rubeculus, Miller. Smiths. Misc. Coll. vol. 45. 1903. p. 22.
(Khao Sai Dow, Trang, Peninsular Siam).

Inhabits Peninsular Siam where specimens have been reported from Trang, Khao Nawng and Khao Wang Hip.

174. *CALLOSCIURUS ERYTHRAEUS PRANIS* (Kloss).

Sciurus erythraeus pranis, Kloss. Journ. Nat. Hist. Soc. Siam, II. 1916. p. 178. (Koh Lak, S. Siam).

Found in the country north of the distributional area of the former race.

175. *CALLOSCIURUS ATRODORSALIS THAI* (Kloss).

Sciurus atrodorsalis thai, Kloss. Journ. Nat. Hist. Soc. Siam, II. 1917. p. 285. (Raheng, Central Siam).

Apparently confined to Central Siam but extending southwards at least to about Lat. N. 12°, as specimens have been obtained at Hue Sak near the Siam—Tenasserim frontier.

176. *CALLOSCIURUS ATRODORSALIS ZIMMEENSIS* Rob. & Wroughton.

Callosciurus atrodorsalis zimmeensis, Robinson & Wroughton. Journ. F. M. S. Mus. VII. 1917. p. 91. (Chiangmai, N. Siam).

Inhabits Northern Siam but extends southwards on the western side of the M'ping river as far as Paknam Po.

177. *CALLOSCIURUS ATRODORSALIS TACHIN* (Kloss).

Sciurus atrodorsalis tachin, Kloss. Journ. Nat. Hist. Soc. Siam, II. 1916. p. 178 (Tachin, Central Siam).

Found at, and originally described from Tachin, west of Bangkok. Specimens from the Province of Ratburi may possibly belong to this race.

178. *CALLOSCIURUS FINLAYSONI FINLAYSONI* (Horsf.).

Sciurus finlaysoni, Horsfield. Zool. Res. in Java. 1824. (Koh Si Chang).

The White Squirrel inhabiting Koh Si Chang, in the inner Gulf of Siam, should bear Horsfield's name and then *C. f. portus* Kloss, becomes a synonym.

179. *CALLOSCIURUS FINLAYSONI TACHARDI* Rob.

Callosciurus finlaysoni tachardi, Robinson, Journ. F. M. S. Mus. VII. 1916. p. 36. (R. Mee Nan, Siam).*

[*The Nan River, Eds.]

There has been much controversy lately about the correct name of the White Squirrel from the mainland of Siam, but it seems evident that Horsfield meant the island form when he gave it the name of *Sciurus finlaysoni*. The mainland form, therefore, must bear the name *C. f. tachardi* as proposed by Robinson. It is quite common in Eastern and Central Siam but less so in the Northern parts of the country. Never recorded from Peninsular Siam.

180. *CALLOSCIURUS FINLAYSONI* HARMANDI (M. Edw.).

Sciurus harmandi, A. Milne Edwards. Bull. Soc. Philom. (6) XII. 1876. p. 8. (Phu Kok, Chantaboon).

A doubtful form, having only been recorded from Kampengpet, Central Siam by Bonhote (P. Z. S. 1901. p. 51.)

181. *CALLOSCIURUS FINLAYSONI* FOLLETTI (Kloss).

Sciurus finlaysoni folletti, Kloss, Journ. Nat. Hist. Soc. Siam 1. 1915. p. 159. (Koh Phai).

An Island race inhabiting Koh Phai in the inner Gulf of Siam.

182. *CALLOSCIURUS FINLAYSONI* TROTTERI (Kloss.).

Sciurus finlaysoni trotteri, Kloss, Journ. Nat. Hist. Soc. Siam II. 1916. p. 178. (Koh Lan).

Another Island race found on Koh Lan in the Inner Gulf of Siam.

183. *CALLOSCIURUS EPOMOPHORUS* EPOMOPHORUS (Bonh.)

Sciurus epomophorus, Bonhote. Ann. & Mag. Nat. Hist. (7) VII. 1901. p. 272. (Salanga Island).

Inhabits the Island of Salanga (Puket) off the western coast of Peninsular Siam.

184. *CALLOSCIURUS EPOMOPHORUS* FLUMINALIS (Rob. & Wrought.)

Sciurus epomophorus fluminalis, Robinson & Wroughton. Journ. F.M.S Mus. IV. 1911. p. 233. (McPing rapids, N. Siam).

Hitherto only recorded from the type locality.

185. *CALLOSCIURUS EPOMOPHORUS* INEXPECTATUS (Kloss).

Sciurus epomophorus inexpectatus, Kloss. Journ. Nat. Hist. Soc. Siam II. 1916. p. 178. (Koh Lak, Pran, S. W. Siam).

Found in South-western Siam. Specimens from the Province of Rathuri probably belong to this same race.

186. *CALLOSCIURUS EPOMOPHORUS ADANGENSIS* (Miller).

Sciurus adangensis, Miller. Smiths. Misc. Coll. vol. 45. 1903. p. 17.
(Pulan Adang, Butang Islands).

Found on Pulau Adang, one of the Butang Islands off the western coast of Peninsular Siam.

187. *CALLOSCIURUS EPOMOPHORUS CASENSIS* (Miller).

Sciurus casensis, Miller. Smiths. Misc. Coll. vol. 45. 1903. p. 20.
(Chance Island, Mergui Archipelago).

Inhabits Chance Island in the Siamese part of the Mergui Archipelago.

188. *CALLOSCIURUS CONCOLOR CONCOLOR* (Blyth).

Sciurus concolor, Blyth. Journ. Asiat. Soc. Bengal XXIV. 1855.
p. 474. (Malacca).

Specimens recorded under this name have been collected at Bang Nara, Patani, Jalor and Nawngchik.

189. *CALLOSCIURUS CONCOLOR TERUTAVENSIS* (Thos. & Wrought.).

Sciurus concolor terutavensis, Thomas & Wroughton. Ann. & Mag. Nat. Hist. (8) IV. 1909. p. 535. (Pulan Terutan).

Inhabits Pulau Terutan off the western coast of Peninsular Siam.

190. *CALLOSCIURUS CONCOLOR MILLERI* (Rob. & Wrought.).

Sciurus epomophorus milleri, Robinson & Wroughton. Journ. F.M.S. Mus. IV. 1911. p. 233. (Trang, Peninsular Siam).

Fairly common in Peninsular Siam where specimens have been obtained at Ban Koh Klap (Bandon), Klong Wang Hip (Tung Song) and Trang.

191. *CALLOSCIURUS CONCOLOR SAMUIENSIS* (Rob. & Kloss).

Sciurus concolor samuiensis, Robinson & Kloss. Ann. & Mag. Nat. Hist. (8) XIII. 1914. p. 226. (Koh Samui).

An Island race found on Koh Samui.

192. *CALLOSCIURUS CONCOLOR FALLAX* (Rob. & Kloss).

Sciurus concolor fallax, Robinson & Kloss. Ann. & Mag. Nat. Hist. (8) XIII. 1914. p. 225. (Koh Pennan).

Very common and only found on Koh Pennan.

193. *CALLOSCIURUS CANICEPS CANICEPS* (Gray).

Sciurus caniceps, Gray. Ann. & Mag. Nat. Hist. X. 1842. p. 263.
(N. Tenasserim).

Widely distributed and very common throughout the whole country.

194. *CALLOSCIURUS CANICEPS HELGEI* (Gyldenst.).

Sciurus helgei, Gyldenstolpe, Kungl. Sv. Vetenskapsakad. Handl. Bd. 57. No. 2. 1917. p. 34. (Koh Lak, S.W. Siam).

Hitherto only obtained at the type locality.

195. *CALLOSCIURUS ALBIVEXILLI* (Kloss).

Sciurus albivexilli, Kloss, P.Z.S. 1916. p. 47. (Koh Kut).

Apparently confined to the Island of Koh Kut in the inner Gulf of Siam.

196. *CALLOSCIURUS FERRUGINEUS CINNAMOMEUS* (Temm.).

Sciurus cinnamomeus, Temminck, Esq. Zool. Guinée. 1853. p. 250. (Cambodia).

This beautiful red Squirrel is very common in Northern, Central, Eastern and South-eastern Siam, but as far as I know it has never been obtained in Peninsular Siam.

197. *CALLOSCIURUS FERRUGINEUS FRANDSENI* (Kloss).

Sciurus finlaysoni frandseni, Kloss, P.Z.S. 1916. p. 46. (Koh Chang).

Inhabits Koh Chang, an Island off the coast of South-eastern Siam.

198. *CALLOSCIURUS NOX* (Wrought.).

Sciurus nox, Wroughton, Ann. & Mag. Nat. Hist. 8) II. 1908. p. 397. (Sea-coast South of Bangkok).

This jet black Squirrel only seems to be distributed in South-eastern Siam, where it is by no means common; only a few specimens have been collected, viz., at Sriracha and at Hup Bon.

199. *CALLOSCIURUS BOCOURTI BOCOURTI* (M. Edw.).

Sciurus bocourti, M. Edwards, Rev. Zool. 1867. p. 193. (Ayuthia, Central Siam).

Found in Central Siam, where specimens have been recorded from Ayuthia, Sam Kok and Bangkok.

200. *CALLOSCIURUS BOCOURTI SINISTRALIS* (Wrought.).

Sciurus bocourti sinistralis, Wroughton, Ann. & Mag. Nat. Hist. (8) II. 1908. p. 399. (MeYome river below Pichit, Central Siam).

Found along the Me Yome river north to Pitsanulok, Central Siam.

201. CALLOSCIURUS BOCOURTI DEXTRALIS (Wrought.).

Sciurus bocourti dextralis, Wroughton, Ann. & Mag. Nat. Hist. (8) II. 1908, p. 400, (Kampengpet, Central Siam),

Inhabits the lower Me Ping valley north to Raheng.

202. CALLOSCIURUS BOCOURTI LYLEI (Wrought.).

Sciurus bocourti lylei, Wroughton, Ann. & Mag. Nat. Hist. (8) II. 1908, p. 401, (Chiengmai, Northern Siam),

Found at Chiengmai and its neighbourhood.

203. CALLOSCIURUS BOCOURTI GRUTI (Gyldenst.).

Sciurus bocourti gruti, Gyldenstolpe, Kungl. Sv. Vetenskapsakad. Handl. Bd. 57, No. 2, p. 37, 1917, (Bang Hue Pong, N. Siam).

A mountain species hitherto only obtained at Koon Tan in Northern Siam.

204. CALLOSCIURUS CASTANEOVENTRIS GORDONI (Anders.).

Sciurus Gordoni, Anderson, P.Z.S. 1871, p. 140. (Bhamo, Upper Burma).

Found in Northern Siam, where it seems to be widely distributed and fairly common. Specimens recorded from Doi Sutep, Doi Par Sakeng and Ban Me Na.

205. CALLOSCIURUS VITTATUS MINIATUS (Miller).

Sciurus notatus miniatus, Miller, Proc. Wash. Acad. Sci. II. 1900, p. 79, (Trang, Peninsular Siam),

Inhabits Southern and Peninsular Siam, where specimens have been obtained at Khao Nawng, Khao Wang Hip, Bang Nara, Trang, Jering and Nawngchik.

206. CALLOSCIURUS NIGROVITTATUS BILIMITATUS (Miller).

Sciurus bilimitatus, Miller, Smiths. Misc. Coll. vol. 45, 1903, p. 8, (Tanjong Laboha, Trengganu).

Recorded from Nawngchik in Southern Siam by Bonhote (Fasc. Malayenses Zool. Part. I. 1903, p. 23).

207. CALLOSCIURUS HIPPIRUS (Is. Geoff.).

Sciurus hippurus, Is. Geoff. Mag. de Zool. Cl. I. No. 6, pl. 6, 1832, (Malacca).

Hitherto only reported from Khao Nawng, Bandon, Peninsular Siam.

208. *CALLOSCIURUS PREVOSTII* PREVOSTII (Desm.).

Sciurus prevostii, Desmarest, Mamm. 1822, p. 335. (Malacca).

Only recorded from Bang Nara, Peninsular Siam.

209. *DREMOMYS RUFIGENIS RUFIGENIS* (Blanf.).

Sciurus rufigenis, Blanford, Journ. Asiat. Soc. Bengal, XLVII, pt. 2, 1878, p. 156, pls. 7—8. (Mooleyit, Tenasserim).

The typical form of this Squirrel has only been found in Northern Siam, viz., at Doi Suteh, near Chiengmai.

210. *DREMOMYS RUFIGENIS BELFIELDI* (Bonh.).

Funcambulus rufigenis belfieldi, Bonhote, Journ. F. M. S. Mus. III 1908, p. 9. (Gunong Uli Kali, Selangor).

Common in the Malay Peninsula extending northwards into Peninsular Siam, where specimens have been collected at Khao Nawng and Khao Wang Hip.

211. *TOMEUTES TENUIS SURDUS* (Miller).

Sciurus tenuis surdus, Miller, Proc. Wash. Acad. Sci. 11, 1900, p. 80 (Trang, Peninsular Siam).

Found in Peninsular Siam, where specimens have been obtained at Khao Wang Hip, Bukit Besar, Jalor, Nawngchik and Trang.

212. *TOMEUTES TENUIS GUNONG* (Rob. & Kloss).

Sciurus tenuis gunong, Robinson & Kloss, Journ. F. M. S. Mus. V. 1916, p. 119. (Khao Nawng, Bandon, Peninsular Siam).

A mountain species, hitherto only found at the type locality, and even there at considerable elevations.

213. *TOMEUTES ROBINSONI* (Bonh.).

Sciurus robinsoni, Bonhote, Fasc. Malayenses Zool. Part I, 1903, p. 24. (Bukit Besar, Nawngchik).

Besides from the type locality, this Squirrel has hitherto only been obtained on Khao Nawng, Bandon.

214. *TAMIOPS BARBEI KONGENSIS* (Bonh.).

Sciurus maclellandi kongensis, Bonhote, P. Z. S. 1901, p. 55. (Raheng, Central Siam).

Very common in Northern and Central Siam, from where it extends into South-western Siam at least as far south as Petchaburi.

215. *TAMIOPS MACCLELLANDI NOVEMLINEATUS* (Miller).

Sciurus novemlineatus, Miller. Biol. Soc. Wash. XVI, 1903. p. 147.
(Trang, Peninsular Siam).

Inhabits Peninsular Siam, but northern limits of range not known at the present time. Specimens collected at Trang and Ban Koh Klap (Bandon).

216. *TAMIOPS RODOLPHI* (M. Edw.).

Sciurus rodolphi, M. Edwards, Rev. et Mag. de Zool. XIX. 1867.
p. 227. (Cochin China).

The South-eastern and Eastern parts of Siam are apparently inhabited by this Squirrel, as specimens have been obtained at Lem Ngop. It also extends into Central Siam, as shown by a specimen collected at Krabin, but where it meets *T. barbei kongensis* Bonh. is not known.

217. *RATTUS RATTUS RUFESCENS* (Gray).

Mus rufescens, Gray, Charlesw. Mag. Nat. Hist. 1. 1837. p. 585.
(India).

A common house rat, found throughout the whole country.

218. *RATTUS RATTUS THAI* Kloss.

Rattus rattus thai, Kloss. Journ. Nat. Hist. Soc. Siam. 11. 1917
p. 286. (Raheng, C. Siam).

Recently described from specimens obtained at Raheng in Central Siam, but also found at Me Yen, Lakorn, N. Siam.

219. *RATTUS RATTUS PORTUS* (Kloss).

Epimys rattus portus, Kloss. Journ. Nat. Hist. Soc. Siam. 1. 1915.
p. 221. (Koh Si Chang).

An Island race inhabiting Koh Si Chang in the Inner Gulf of Siam.

220. *RATTUS RATTUS POENITENTIARII* (Kloss).

Epimys rattus poenitentiarii, Kloss. Journ. Nat. Hist. Soc. Siam. 1.
1915. p. 222. (Koh Phai).

Found on Koh Phai, Inner Gulf of Siam.

221. *RATTUS RATTUS JALORENSIS* (Bonh.).

Mus jalorensis, Bonhote. Fasc. Malayenses Zool. Part 1. 1903. p. 28.
(Ban Sai Kau, Nawngchik, Peninsular Siam).

Besides from the type locality, specimens of this race have been

recorded from Koon Tan and Doi Par Sakeng (Northern and North-western Siam). Ban Koh Klap (Bandon, Peninsular Siam) and from the Islands of Koh Samui and Koh Pennan.

222. *RATTUS RATTUS KRAENSIS* (Kloss).

Epinys rattus kraensis, Kloss, P.Z.S. 1916, p. 57. (Koh Kra).

Only found on the Island of Kra, off the coast of South-eastern Siam.

223. *RATTUS RATTUS MAKENSIS* (Kloss).

Epinys rattus makensis, Kloss, P.Z.S. 1916, p. 56. (Koh Mak).

Another Island race inhabiting Koh Mak.

224. *RATTUS RATTUS KLUMENSIS* (Kloss).

Epinys rattus klumensis, Kloss, P.Z.S. 1916, p. 56. (Koh Klum).

Still another form found on Koh Klum.

225. *RATTUS RATTUS RANGENSIS* (Kloss).

Epinys rattus rangensis, Kloss, P.Z.S. 1916, p. 56. (Koh Rang).

Inhabits Koh Rang, where it is fairly common.

226. *RATTUS RATTUS REMOTUS* (Rob. & Kloss).

Epinys remotus, Robinson & Kloss, Ann. & Mag. Nat. Hist. (8) XIII, 1914, p. 281.

Found on Koh Samui and Koh Pennan, off the eastern coast of Peninsular Siam.

227. *RATTUS RATTUS GRISEIVENTER* (Bonh.).

Mus griseiventer, Bonhote, Fasc. Malayenses Zool. Part I. 1903, p. 30. (Bidor, S. Perak).

Originally described from the Malay Peninsula, but specimens also obtained in Siam, viz., at Doi Par Sakeng (N. W. Siam) and on Koh Chang.*

* Several specimens of rats belonging to the *rattus* group have been collected at various places in Siam, such as at Ok Yam, Klong Yai (S.E. Siam), Pak Jong (E. Siam), Krabin (C. Siam), Maprit, Patiyu (Peninsular Siam) and on the Islands of Koh Chang, Koh Mehsi East and Koh Mehsi West, but as these specimens mostly have been immature, it has been impossible to definitely state to which form they belong.

228. *RATTUS RATTUS PANNOSUS* (Miller).

Mus pannosus, Miller. Proc. Biol. Soc. Wash. XIII, 1900. p. 199
(Pulau Adang).

Recorded from Adang Island, off the western coast of Peninsular Siam.

229. *RATTUS RATTUS PANSELLUS* (Miller).

Epimys pannellus, Miller. Smiths. Misc. Coll. vol. 61. No 2'. 1913.
p. 8. (Pulau Rawi, Butang Islands).

Hitherto only found in the type locality.

230. *RATTUS RATTUS FORTUNATUS* (Miller).

Epimys rattus fortunatus, Miller. Smiths. Misc. Coll. vol. 61. No. 21.
1913, p. 15. (Chance Island, Mergui Archipelago).

As far as known this form only inhabits Chance Island in the Siamese part of the Mergui Archipelago.

231. *RATTUS SURIFER SURIFER* (Miller).

Mus surifer, Miller. Proc. Biol. Soc. Wash. XIII. 1900. p 148.
(Trang, Peninsular Siam).

Very common in Southern, South-western and Peninsular Siam. A single specimen has also been recorded from Koon Tan in Northern Siam, so that it seems to be distributed throughout the whole country, though rare in the North.

232. *RATTUS SURIFER FINIS* (Kloss).

Epimys surifer finis, Kloss. P.Z.S. 1916. p. 51. (Klong Menao, S. E. Siam).

Inhabits South-eastern and Eastern Siam, where it is quite common. Specimens obtained at the following localities:—Ok Yam, Klong Yai, Klong Menao, Khao Sebab (S. E. Siam) and at Pak Jong, Hinlap and Sakerat (E. Siam).

233. *RATTUS SURIFER CHANGENSIS* (Kloss).

Epimys surifer changensis, Kloss. P.Z.S. 1916. p. 52. (Koh Chang).
Found on Koh Chang, off the coast of South-eastern Siam.

234. *RATTUS SURIFER KUTENSIS* (Kloss).

Epimys surifer kutensis, Kloss. P.Z.S. 1916. p. 52. (Koh Kut).
Common on Koh Kut.

235. *RATTUS SURIFER PELAGIUS* (Kloss).

Epimys surifer pelagius, Kloss, P.Z.S. 1916, p. 53. (Koh Rang).
A slightly differentiated Island race inhabiting Koh Rang.

236. *RATTUS SURIFER CONNECTENS* (Kloss).

Epimys surifer connectens, Kloss P.Z.S. 1916, p. 53. (Koh Mak).
Inhabits the Island of Koh Mak.

237. *RATTUS SURIFER ECLIPSIS* (Kloss).

Epimys surifer eclipsis, Kloss, P.Z.S. 1916, p. 53. (Koh Kra).
Exclusively found on the Island of Koh Kra.

238. *RATTUS SURIFER TENEBROSUS* (Kloss).

Epimys surifer tenebrosus, Kloss, P.Z.S. 1916, p. 54. (Koh Klum).
Still another of the numerous Island races. Inhabits Koh Klum.

239. *RATTUS SURIFER MANICALIS* (Rob. & Kloss).

Epimys surifer manicalis, Robinson & Kloss, Ann. & Mag. Nat. Hist.
(8) XIII. 1914, p. 230. (Koh Penman).

Found on the Island of Koh Penman, off the Eastern coast of
Peninsular Siam.

240. *RATTUS SURIFER SPURCUS* (Rob. & Kloss).

Epimys surifer spurcus, Robinson & Kloss, Ann. & Mag. Nat. Hist.
(8) XIII. 1914, p. 230. (Koh Samui).

Common on Koh Samui, off the eastern coast of Peninsular
Siam.

241. *RATTUS SURIFER BUTANGENSIS* (Miller).

Mus surifer butangensis, Miller, Proc. Biol. Soc. Wash. XIII. 1900.
p. 190, (Pulau Adang, Butang Islands).

An Island form obtained on Pulau Adang and Pulau Rawi.

242. *RATTUS SURIFER CASENSIS* (Miller).

Mus casensis, Miller, Smiths. Misc. Coll. vol. 45, 1903, p. 38 (Chance
Island, Mergui Archipelago).

Only obtained on Chance Island in the Siamese part of the
Mergui Archipelago.

243. *RATTUS VOCIFERANS VOCIFERANS* (Miller).

Mus vociferans, Miller, Proc. Biol. Soc. Wash. XIII. 1900, p. 138.
(Trang, Peninsular Siam).

Originally described from Trang but apparently distributed throughout Peninsular Siam, as specimens have also been obtained at Ban Koh Klap, Khao Nawng (Bandon) and at Maprit (Patiyu).

244. *RATTUS VOCIFERANS HERBERTI* (Kloss).

Epimys vociferans herberti, Kloss, Journ. Nat. Hist. Soc. Siam, II, 1916, p. 25 (Pak Jong).

A specimen collected at Pak Jong in Eastern Siam is said to differ from the typical form, but nothing is known about its occurrence and distribution.

245. *RATTUS VOCIFERANS TERSUS* (Thos. & Wrought.).

Mus vociferans tersus, Thomas & Wroughton, Ann. & Mag. Nat. Hist. (8) IV, 1909, p. 535 (Pulan Terutau).

An Island race found on Pulau Terutau, off the Western coast of Peninsular Siam.

246. *RATTUS FULVESCENS BUKIT* (Bonh.).

Mus bukit, Bonhote, Ann. & Mag. Nat. Hist. (7) XI, 1903, p. 125 (Bukit Besar, Nawngchik, Peninsular Siam).

Obtained in Peninsular (Bukit Besar and Chong) as well as in Northern, Siam (Doi Suteh, near Chiangmai) but rather rare.

247. *RATTUS FULVESCENS MARINUS* (Kloss).

Epimys jerdoni marinus, Kloss, P. Z. S., 1906, p. 50 (Koh Chang).

Originally described from Koh Chang, off the coast of South-eastern Siam, but also found on Koh Kut.

248. *RATTUS FULVESCENS PAN* (Rob. & Kloss).

Epimys jerdoni pan, Robinson & Kloss, Ann. & Mag. Nat. Hist., (8) XIII, 1914, p. 229 (Koh Samui).

Common on the Island of Koh Samui, off the Eastern coast of Peninsular Siam,

249. *RATTUS FULVESCENS ORBUS* (Rob. & Kloss).

Epimys orbus, Robinson & Kloss, Ann. & Mag. Nat. Hist. (8) XIII, 1914, p. 228 (Khao Nawng, Bandon, Peninsular Siam).

Hitherto only known from the type specimen.

250. *RATTUS BERDMOREI MAGNUS* (Kloss).

Epimys berdmorei magnus, Kloss, P. Z. S. 1916, p. 57, (Klong Menao, S. E. Siam).

Only known from the type locality where a single specimen was obtained by Kloss on the 12th. January 1915.

251. *RATTUS CREMORIVENTER CREMORIVENTER* (Miller).

Mus cremoriventer, Miller, Proc. Biol. Soc. Wash, XIII, 1900, p. 144, (Trang, Peninsular Siam).

Recorded from Trang, Jalor and Nangchick in Peninsular Siam.

252. *RATTUS CREMORIVENTER SOLUS* (Miller).

Epimys solus, Miller, Smiths. Misc. Coll, vol. 61, No. 21, 1913, p. 22, (Pulau Terutau).

An Island race inhabiting Pulau Terutan.

253. *RATTUS FERREOCANUS* (Miller).

Mus ferreocanus, Miller, Proc. Biol. Soc. Wash, XIII, 1900, p. 140, (Trang, Peninsular Siam).

Peninsular Siam where specimens have been collected in Trang, and at Maprit (Patiyu).

254. *RATTUS VALIDUS* (Miller).

Mus validus, Miller, Proc. Biol. Soc. Wash, XIII, 1900, p. 141, (Trang, Peninsular Siam).

A southern form inhabiting Peninsular Siam where specimens have been obtained at Trang, Khao Nawng (Bandon) and at Klong Bang Lai (Patiyu).

255. *RATTUS CONCOLOR* (Blyth).

Mus concolor, Blyth, Journ. Asiat. Soc. Bengal XXVIII, 1859, p. 295. (Schwegyen, Burma).

Apparently commonly distributed throughout the whole country.

256. *RATTUS SAKERATENSIS* Gyldenst.

Rattus sakeratensis, Gyldenstolpe, Kungl. Sv. Vetenskapskad. Handl Bd. 57, No. 2, 1917, p. 46 (Sakerat, E. Siam).

Hitherto only known from the type specimen.

257. *RATTUS PELLAX* (Miller).

Mus pellax, Miller, Proc. Biol. Soc. Wash. XIII, 1900, p. 147 (Trang, Peninsular Siam).

Recorded from Trang in Peninsular, and from Hat Sanuk in South-western, Siam.

258. *RATTUS ASPER* (Miller).

Mus asper, Miller, Proc. Zool. Soc. Wash. XIII, 1900 p. 145 (Trang, Peninsular Siam).

This form has up to the present time only been found within Siamese territory at Trang.

259. *MUS-MUSCULUS* Linn.

Mus musculus, Linnaeus, Syst. Nat. 1, Ed. 10, 1758, p. 62 (Upsala, Sweden).

Recorded from Nan by Bonhote, from Bangkok by Flower, and from "Siam" by Pousargues.

260. *MILLARDIA MELTADA* (Gray).

Golunda meltada, Gray, Charlesworth's Mag. Nat. Hist. 1, 1837, p. 586 (Bombay).

Obtained at Biserat, Jalor, according to Bonhote.

261. *TAUTATUS THAI* Kloss.

Tautatus thai, Kloss, Journ. Nat. Hist. Soc. Siam 11, 1917, p. 280 (Raheng, Central Siam).

Up to the present time only found in the type locality, where a single female specimen was collected in February 1917.

262. *VANDELEURIA SIBYLLA* Thos.

Vandeleuria sibylla, Thomas, Journ. Bombay Nat. Hist. Soc. XXIII, 1914 p. 202 (Chantaboon, S. E. Siam).

Recently described on specimens collected at Chantaboon, South-eastern Siam.

263. *CHIROPODOMYS GLIROIDES* (Blyth).

Mus gliroides, Blyth, Journ. Asiat. Soc. Bengal XXIV, 1855, p. 721 (Cherra Punji).

Apparently very rare in Siam; only recorded from Lat Bua Kao in Eastern Siam by Kloss, and from Si-sa-wat, in the Ratburi Province by Gairdner.

264. *HAPALOMYS LONGICAUDATUS* Blyth.

Hapalomys longicaudatus, Blyth, Journ. Asiat. Soc. Bengal XXVIII, 1859, p. 226 (Schwegyen, Burma).

Of this rare species only a few specimens have been collected in Siam, viz. at the Qana Noi river (14°22'N. Lat.) in the Province of Ratburi, and at Patani.

265. *BANDICOTA MORDAX* THOS.

Bandicota mordax, Thomas, Journ. Bombay Nat. Hist. Soc. XXIV, 1916, p. 642 (Chiengmai, N. Siam).

Recently described on a specimen collected at Chiengmai in Northern Siam, but nothing else known about its distribution and occurrence in Siam.

266. *NYCTOCLEPTES SUMATRENSIS* (Raffl.).

Mus sumatrensis, Raffles, Trans. Linn. Soc. XIII, 1822, p. 258 (Sumatra).

Recorded from several localities in Peninsular Siam (Ban Koh Klap, Biserat, Jalor), and from Rathuri, but northern limits of range not known.

267. *NYCTOCLEPTES CINEREUS* (McClell.).

Rhizomys cinereus, McClelland, Calcutta Journ. Nat. Hist. Soc. II, 1842, p. 356 (Tenasserim).

Hitherto only recorded from the Me Taw forest near Raheng in Central Siam and from North-western Siam (Doi Par Sakeng). Fairly common in the bamboo jungles.

268. *RHIZOMYS PANNOSUS* THOS.

Rhizomys pannosus, Thomas, Ann. & Mag. Nat. Hist. (S) XVI, 1915, p. 60 (Tantaboon, S. E. Siam).

Recently described from Chantaboon in South-eastern Siam, but distribution still unknown.

269. *CANNOMYS MINOR* (Gray).

Rhizomys minor, Gray, Ann. & Mag. Nat. Hist. (1) X, 1842, p. 266 (Cochin China?).

Imperfectly known and specimens highly desirable. Recorded from Nan, Chiengmai, Raheng and Petchaburi, but uncertain if the specimens belong to *C. minor* Gray, or to the northern race *Cannomys badius* Hodgs.

270. *CANNOMYS MINOR LÖNNBERGI* GYLDENST.

Cannomys minor lönnbergi, Gyldenstolpe, Kungl. Sv. Vetenskapsakad. Handl. Bd. 57, No. 2, 1917, p. 47 (Sakerat, E. Siam).

This race is apparently confined to Eastern Siam as it has only been obtained up to the present time in the type locality.

271. *ACANTHION BRACHYURUS* (Linn.).

Hystrix brachyura, Linnaeus, Syst. Nat. I. Ed. 10, 1758, p. 57 (Malacca).

Obtained and recorded from Peninsular Siam, where specimens have been collected at Bang Nara, Biserat and Jalor. Mentioned as an inhabitant of "Siam" by Flower.

272. *ACANTHION KLOSSI* Thos.

Acanthion klossi, Thomas. Ann. & Mag. Nat. Hist. (8) XVII. 1916, p. 139 (Tenasserim).

Besides the specimen from the type locality (Tenasserim Town) it has also been obtained at Klong Yai (S. E. Siam) according to Kloss, and in South-western Siam at 12° N. 99° 50' E. by Gairdner. A specimen collected in Northern Siam by myself may also be referred to this form, which therefore seems to be found throughout almost the whole country.

273. *ACANTHION TERUTAUS* (Lyon).

Atherurus terutaus, Lyon, Proc. U. S. Nat. Mus. XXXII, 1907, p. 587 (Pulau Terutau).

Confined to the Island of Terutau, off the Western coast of Peninsular Siam.

274. *ATHERURUS MACROURUS* (Linn.).

(*Hystrix macroura*, Linnaeus, Syst. Nat. 1. Ed. 10. 1758. p. 57 (East Indies).

Recorded from Trang by Lyon and from Biserat by Bonhote.

275. *LEPUS SIAMENSIS* Bonh.

Lepus siamensis, Bonhote, P. Z. S. 1902, p. 40 (Siengmai, N. Siam).

Hares belonging to this form are fairly common in suitable localities throughout the whole country. Southward they extend at least to Koh Lak where they are quite common.

ORDER UNGULATA.

SUBORDER PROBOSCIDEA.

276. *ELEPHAS MAXIMUS* Linn.

Elephas maximus, Linnaeus, Syst. Nat. 1. Ed. 10, 1758, p. 33 (Ceylon).

Wild Elephants occur throughout Siam, and they are not uncommon in suitable localities.

SUBORDER PERISODACTYLA.

277. *RHINOCEROS SONDAICUS* Desm.

Rhinoceros sondaicus, Desmarest, Mammalogie. vol. 11. 1822, p. 399 (Assam).

The Two-horned Rhinoceros occurs in Siam but is rather rare, though found in suitable localities throughout South-western, and Northern Siam and Laos.

278. RHINOCEROS SUMATRENSIS Cuv.

Rhinoceros sumatrensis, Cuvier, Regne Animal 1, 1817, p. 240 (Sumatra).

The One-horned Rhinoceros also inhabits Siam where it is sparingly found along the Western frontier, but its distribution is still very imperfectly known like that of the former species. It seems, however, to be more common in the southern districts than in the north.

279. TAPIRUS INDICUS Desm.

Tapirus indicus, Desmarest, Nouv. Diet. Hist. Nat. XXXII 1819, p. 458 (Malay Peninsula).

The distribution of the Tapir in Siam is very imperfectly known, but it seems to occur in Peninsular and South-western Siam, at least north to the Province of Ratburi. According to Pousargues it also inhabit South-eastern Siam. Said to be fairly common in Patani, and recorded from Hat Sanuk and Hue Sai near the Siam-Tenasserim frontier.

SUBORDER ARTIODACTYLA.

280. SUS CRISTATUS JUBATUS Miller.

Sus jubatus, Miller, Proc. U. S. Nat. Mus. XXX, 1906, p. 745 (Trang, Peninsular Siam).

The Malayan Maned Pig, which is very common in the Malay Peninsula, and especially in the southern parts, also seems to occur in Siam, but as very few specimens have been collected, its distribution towards the north is quite uncertain. It seems, however, to be fairly common in Peninsular and South-western Siam. Wild Pigs also occur in the northern districts, but whether they belong to this or another allied race is unknown. Also recorded from the Island of Koh Chang.

281. SUS CRISTATUS JUBATULUS Miller.

Sus jubatulus, Miller, Proc. U. S. Nat. Mus. XXX, 1906, p. 746 (Pulau Teratau).

A slightly differentiated Island race inhabiting Teratau, off the western coast of Peninsular Siam.

282. *TRAGULUS KANCHIL AFFINIS* Gray.

Tragulus affinis, Gray, P. Z. S. 1861, p. 138 (Cambodia).

Inhabits Eastern, and Central Siam, but southern limits of range still unknown. Specimens recorded from the following localities:—Muak Lek, in the Dong Phya Fai (Eastern Siam); Ok Yam, Chantaboon (South-eastern Siam), Koh Lak and Hat Sanuk (South-western Siam).

283. *TRAGULUS KANCHIL RAVUS* Miller.

Tragulus rarus, Miller, Proc. Biol. Soc. Wash, XV, 1902, p. 163 (Trang, Peninsular Siam).

A Southern form inhabiting Peninsular Siam, where specimens have been collected at Trang, Ban Koh Klap (Bandon) and Maprit (Patiyu). Northern limits of range not definitely ascertained.

284. *TRAGULUS KANCHIL WILLIAMSONI* Kloss.

Tragulus kanchil williamsoni, Kloss, Journ. Nat. Hist. Soc. Siam, II, 1916, p. 88 (Me Song forest. Muang Prae, N. Siam).

A northern form apparently confined to Northern Siam, where it is fairly common.

285. *TRAGULUS KANCHIL RAVULUS* Miller.

Tragulus ravulus, Miller, Proc. Biol. Soc. Wash. XVI. 1903, p. 41 (Pulau Adang, Butang Islands).

An insular race inhabiting Pulu Adang, off the western coast of Peninsular Siam.

TRAGULUS KANCHIL FULVIVENTER > *RAVUS*.

Specimens from the Province of Bandon in Peninsular Siam seem to be intermediate between *T. kanchil fulviventer* and *T. kanchil rarus*.

286. *TRAGULUS CANESCENS CANESCENS* Miller.

Tragulus canescens, Miller. Proc. Biol. Soc. Wash, XIII, 1900, p. 185, (Trang, Peninsular Siam).

Except those from the type locality, no authentic specimens of the Larger Mouse Deer have been recorded from Siamese territory.

287. *TRAGULUS CANESCENS TERUTUS* Thos. & Wrought.

Tragulus canescens terutus, Thomas & Wroughton. Ann. & Mag. Nat. Hist. (8) IV. 1909, p. 536. (Pulau Terutau).

Found on the Island of Terutau, off the western coast of Peninsular Siam.

288. *MUNTIACUS MUNTJAK CURVOSTYLIS* (Gray).

Cervulus curvostylis, Gray. Cat. Ruminants Brit. Mus. 1872. p. 94.
(Petchabun, Central Siam).

Inhabits South-western, Central, Eastern and South-eastern Siam, but northern limits of range not ascertained. Specimens recorded from the Me Taw forest near Raheng, from Petchabun, Muak Lek, Bangpakong, Ratburi, Hat Samuk etc. Specimens from Peninsular Siam may possibly belong to this form. Also recorded from the Island of Koh Chang, off the coast of South-eastern Siam, but whether the Island is inhabited by this or an allied race is still unknown.

289. *MUNTIACUS MUNTJAK VAGINALIS* (Bodd.).

Cervus vaginalis, Boddaert. Elench. Anim. I. 1785. p. 136. (Bengal).

Confined to Northern Siam, where specimens have been collected at Koon Tan, Bang Hue Pong and Me Lem.

290. *MUNTIACUS FEAE* (Thos. & Doria).

Cervulus feae, Thomas & Doria. Ann. Mus. Genova. (2) VII. 1889.
p. 92. (Mooleyit, Tenasserim).

Apparently very rare and exclusively confined to South-western Siam, where specimens have been recorded from Menam Lor near Quaa Noi (14°. 23". N. Lat.) in the Province of Ratburi.

291. *CERVUS UNICOLOR EQUINUS* Cuv.

Cervus equinus, Cuvier. Ossements Fossiles Ed. 2. vol. IV. 1823.
p. 45. (Sumatra).

Rather common throughout the whole country.

292. *CERVUS ELDI PLATYCEROS* (Gray).

Panolia platyceros, Gray. List. Mamm. Brit. Mus. 1843. 181.
(S. Siam).

"Thamins"* are not uncommon in suitable localities throughout the whole country, but their southern limit of range still not ascertained. Specimens recorded from Chienghai, Me Lua (N. Siam), Non Luum (E. Siam), Chawn Bung and Nawng Pla Duk (Ratburi), Choraké Sampan (Kamburi) and from the neighbourhood of Lopburi (Central Siam).

293. *CERVUS SCHOMBURGI* Blyth.

Cervus (Rucervus) schomburghi, Blyth. P. Z. S. 1863. pp. 155 & 835.
(Siam).

* Siamese=lamang.

Very little is known at the present time about the distribution and occurrence of Schomburgk's Deer in Siam. Probably found in Central Siam on the great swampy plains around Paknam Po and possibly in Muang Petchabun.

294. *CERVUS PORCINUS ANNAMITICUS* (Heude).

Hyelaphus annamiticus, Heude. Mém. Hist. Nat. Emp. Chinois II, 1888, p. 50. (Annam).

Hog-Deer are said to be quite common on the grassy plains in the Province of Chantaboon, South-eastern Siam. Also observed by the present author at Nong Bea in North-western Siam, but whether the northern specimens belong to this or an allied race is still unknown, as no specimens have been collected and properly examined.

295. *CAPRICORNIS SUMATRENSIS MILNE-EDWARDSI* David.

Capricornis milne-edwardsi, David. Arch. Mus. Paris. V. 1869, p. 10. (Moupin, Szechuan, China).

Fairly rare though occurring among the mountain regions of Northern and probably South-western and Western Siam. As no Siamese specimens have been properly examined up to the present time it seems impossible to ascertain if the Goat Antelopes found in Siam are identical with the Chinese form or not.

296. *CAPRICORNIS SUMATRENSIS SWETTENHAMEI* (Butler).

Nemorhaeetus swettenhamei, Butler. P. Z. S. 1900, p. 675. (Larut Hills, Perak, S. Malay Peninsula).

Even of this form very little is known at the present time, but it probably inhabits Peninsular and possibly South-western Siam. Recorded from Jalor and Patani by Bonhote. The specimens obtained at Koh Lak probably belong to this form.

297. *BOS BUBALIS* Linn.

Bos bubalis, Linnaeus. Syst. Nat, Ed. 10. 1758. p. 72. (India).

Some herds of semi-domesticated Water Buffaloes occur in Siam, where they have been recorded from Muang Pimai in Eastern, from Pailin in South-eastern, from Sam Roi Yot in South-western, and from the neighbourhood of Raheng in Central, Siam, but really wild Water Buffaloes do not occur in the country.

298. *BOS GAURUS READI* Lydekker.

Bos gaurus readi, Lydekker. Zoologist (4) VII. 1903. p. 266. (Burma).

The Burmese race of the Gaur probably inhabits Northern and North-western Siam, where it seems to be fairly common in the mountain regions. Southern limits of range not definitely known. Gaur are, however, not rare on the Siam-Tenasserim boundary, but whether they belong to the Burmese or to the Malayan race (*Bos gaurus habachi* Lyd.) is not known.

299. BOS BANTENG BIRMANICUS Lydekker.

Bos sondaicus birmanicus, Lydekker. P. Z. S. 1898. p. 277. (Burma).

The Banteng or Tsaine occurs among the mountain regions throughout Siam, though it seems to be more common in the Northern and Central parts of the country. Southwards it extends at least down to the Province of Ratburi, according to Gairdner. From the Raheng district of Central Siam, Lydekker has described a spotted Tsaine under the name of *Bos porteri* (P. Z. S. 1909. p. 669.), which is apparently only an individual variation of *birmanicus*.

ORDER SIRENIA.

300. HALICORE DUGONG (Erxl.).

Trichechus dugong, Erxleben. Syst. Reg. Anim. 1777. p. 599.

The Dugong has been found on the shores of the Indian Ocean from East Africa to Australia, and it has been mentioned from "Siam" by Flower.

ORDER CETACEA.

SUBORDER ODONTOCETI.

301. SOTALIA SINENSIS (Flower).

Delphinus sinensis, Flower. Trans. Zool. Soc. VII. 1870. p. 151, (Amoy).

Kloss, when sailing from Klong Yai to Klong Menao in South-eastern Siam, observed a number of white Cetaceans near the shore which he believes belonged to this species.

302. ORCAELLA BREVIROSTRIS (Owen).

Phocaena brevirostris, Owen. Trans. Zool. Soc. VI. 1866 p. 24. pl. 4. figs. 1-3. (India).

Specimens of the Larger Indian Porpoise have been recorded from Patani by Bonhote and by Kloss from the Chantaboon coast, where one specimen was obtained at Klong Yai on the 6th December

1914. Up to the present time our knowledge of the Cetaceans inhabiting Siam is very imperfect, and some other species may probably be included in the Siamese fauna.

ORDER EDENTATA.

SUBORDER NOMARTHRA.

303. MANIS JAVANICA Desm.

Manis javanica, Desmarest, Mamm. 1822, p. 377. (Java).

The Malay Pangolin seems to be found in suitable localities throughout Siam. Specimens have been recorded from Northern (Nan, Doi Sutep), from Eastern (Muang Pa Tong Tschai), from South-western (Ratburi) and from Peninsular, Siam (Jalor and Nawngchik). The Chinese form (*Manis aurita* Hodgson) may also be found in Northern Siam, but no authentic specimens have yet been recorded.

ADDENDA:

Owing to the state of war in Europe the author has not been able to look through the different periodicals published regularly during the last few years, and he may therefore be unaware of some recently described species of Mammals from Siam.

Since the above was written I have received information that a species of Mongoose has been erected by Mr. Boden Kloss, viz.:

MUNGOS INCERTUS Kloss.

Mungos incertus, Kloss. Journ. F. M. S. Mus. VII. 1917 p. 125.
(Ongut, Trang, Peninsular Siam).

Only known at present from the single type specimen.

Royal Natural History Museum,

Vetenskapsakademien, Sweden, Dec. 1918.

NOTES ON A COLLECTION OF BIRD-SKINS
FORMED BY MR. E. G. HERBERT, C.M.Z.S., M.B.O.U.

BY E. C. STUART BAKER, F.L.S., F.Z.S., M.B.O.U.

The following notes are the result of an examination of the collection of beautiful skins brought home by Mr. E. G. Herbert from Siam, and presented with great generosity to the British Museum of Natural History. The Museum Authorities have kindly allowed me to work out the collection, placing every facility and help at my disposal for so doing, and I had hoped long before this to have completed my pleasant task, and to have despatched the results to Siam. Work under present circumstances has been, however, a very difficult matter, and I have not been able to spend as much time as I could have wished in pressing it forward. It is better, therefore, perhaps, to publish as much as has been done, and the rest when possible. A considerable number of new sub-species have been described, and it is desirable that these should be made known in Siam as soon as possible; also workers in that country, who have not the mass of material for comparison such as is available to workers in England, may find the following notes of some help in diagnosing the geographical races of the birds they obtain.

A preface in articles of this nature is generally more or less an epitome of the completed results; this, however, must wait until a later date, when I hope Mr. Herbert may also be able to add something describing the country worked over.

Siam is a country in which much ornithological work remains to be done; many species and sub-species have recently been discovered and described, and doubtless many more remain to be discovered in the near and distant future. But there is also much we still have to learn regarding the distribution and life-history, especially nidification, of those birds we already know.

Mountains of great height, swamps and lakes of vast extent, dense forests and wide grass-lands alike form part of Siam, and great distances separate North from South, so that variety of species is very great, and geographical races are exceptionally numerous. In the North and West we find that the majority of birds are more or less typically Burman, or even Indo-Burman, to the East we get a typical Chinese avifauna, whilst in the long strip of country running South,

parallel with Tenasserim, to the Malay Peninsula, the birds are nearly all Malayan. Thus, within Siam itself, it is quite possible to obtain two, or even three, sub-species of the same species.

Much more material is still required before we can definitely work out the geographical distribution of its avifauna, and it is to be hoped that the excellent work done by Count Gyldenstolpe and Messrs. Robinson and Kloss, Williamson, Herbert and Gairdner will be continued with the same success as hitherto.

Such deductions as it may be possible to make when the examination of the collection is completed will be made in a post-script then, instead of the preface now.

[In publishing the following notes written by Mr. E. C. Stuart Baker, I wish to express my deepest gratitude to him for his kindness in undertaking the task of working out the birds taken home by me, and to compliment him on the very thorough way in which he has carried it out. Few, I think, will realize the enormous amount of work this has entailed, for the Siamese birds have been compared with the very large collection of birds in the British Museum, often amounting to many hundreds of the same species.

Mr. Stuart Baker has provided us in Siam with a great deal of interesting and most valuable information, and in several instances he has given us a direct incentive to further work, by pointing out that a better series of Siamese skins is required to determine exactly to which sub-species the birds belong. The notes will also have a more far-reaching effect, in that they will provide a useful work of reference for those who study the birds of India, as well as other countries further East.

Some of the birds appearing in the following notes have already been described by Mr. Stuart Baker as new sub-species in the B. O. C. Bulletins, and in notes in the "Ibis", and unfortunately the names of the localities from which they were obtained were not correctly spelt on the labels, which has led to some confusion. *Pak Jong* on the Korat railway line is in Eastern Siam, and there can be little doubt that, through incorrect spelling, this has been taken to be *Pak Chan* in Renong, which is in Peninsular Siam. The zoogeographical divisions, as generally used in this Journal, are now given after the name of each locality.

It is a matter of much regret that I am unable to add any field notes, as I was not able to accompany my collector on his various expeditions, and my personal experience is almost entirely confined to the Bangkok area.

The following localities are referred to :—

IN CENTRAL SIAM :—

SAMKOK, on the Chao Phya river, about 40 miles N. of Bangkok.

KRABIN, on the Bangpakong river, about 80 miles E.N.E. of Bangkok.

HUA TAKHAE, on the Petriu railway line.

PETRIU, on the Bangpakong river, and due E. of Bangkok.

PAKNAM, at the mouth of the Chao Phya river.

MEKLONG, at the mouth of the Meklong river and about 60 miles W. of Bangkok.

TACHIN, on the river of that name situated about midway between the Meklong and Chao Phya rivers.

IN EASTERN SIAM :—

HINLAP, MUAK LEK, PAK JONG, CHAN TEUK, railway stations on the line to Korat as it crosses the Dong Rek range.

IN SOUTH EASTERN SIAM :—

HUP BON, about 12 miles E. of Sriracha.

SRIRACHA, on the eastern side of the Gulf about 40 miles from the mouth of the Chao Phya river.

IN PENINSULAR SIAM :—

TUNG SONG, or TUNG SAWNG, in Nakon Sritamarat.

KLONG WANG HIP, a stream at the foot of the hills about 8 miles N.E. of Tung Song; the lower slopes of the hill were worked from a camp on this site.

KHAO WANG HIP, a hill about 2,500 feet high; the summit and higher portions of the hill were worked from a half way camp.

MAPRIT, a station on the Southern railway, W. of Patiyu.

KLONG BANG LAI, a camp on the banks of a stream of that name, about 10 miles N. W. of Maprit, and close to the hills.

KOH LAK, in the province of Pran, and recently renamed PRA-
CHUAP KIRIKAN.

May 1919.

E. G. HERBERT, C.M.Z.S., M.B.O.U.]

1. UROCISSA ERYTHORRHYNCHUS MAGNIROSTRIS.

Psilorhinus magnirostris, Blyth. J. A. S. B., xv. p. 27 (1846).

2 ♂ Chan Teuk, E. Siam, 10. 8. 15.

Both the specimens obtained are young birds in heavy moult, but must, of course, belong to this sub-species. Its white-marked head at once separates it from *U. e. erythrorhynchus*. In fully adult birds the size of the bill is alone sufficient to distinguish it from *U. e. occipitalis*; in the latter form the culmen from the gape averages about 32 mm., and in the former about 38 mm.

2. CISSA CHINENSIS.

Coracias chinensis, Bodd. Tabl. Pl. Exl. p. 38 (1783).

♀ Klong Song, near Petriu, C. Siam, 28. 2. 16.

♀ juv. Hup Bon, S. E. Siam, 17. 7. 15.

The young bird has the whole of the under-parts a brilliant lemon-yellow, a not unusual feature in fresh skins of young birds, but unfortunately the yellow invariably fades away as the skin dries and ages, unless it is entirely excluded from all light.

Green Magpies are birds which it is impossible to divide into geographical races, if only the depth and variation of colouring of the reds, blues and greens are used as a means of differentiation, as these colours change with extraordinary rapidity after the bird is killed. Even in life, captive birds differ from wild ones, and healthy ones from those in poor health and condition.

Fortunately, with most species of Green Magpies, there is a difference in the size and distribution of the markings which renders discrimination fairly easy. This, however, is not so in the case of *C. c. minor*, the form hitherto accepted as inhabiting Siam and Malaya, as the differences sometimes alleged to exist in colouration between this and *C. c. chinensis* are not maintainable, whilst I cannot find that the supposed differences in size are any more reliable. Theoretically *C. c. chinensis* is supposed to have a wing from 140-150 mm., whereas *C. c. minor* has it under 135 mm. Of the present two specimens the adult

has a wing of 144 mm., and the young bird one of 138 mm. A careful examination of a larger series of this *Oissa* shews that many specimens of *C. chinensis* have wings under 135 mm., whilst, on the other hand, many specimens of the so-called *minor* have wings well over 140 mm.

I consider *C. c. minor* should be suppressed.

3. DENDROCITTA SINENSIS ASSIMILIS.

Dendrocitta assimilis, Hume, Str. Feath., v., p. 117 (1877).

♂ Chan Teuk, E. Siam, 11. 8. 15.

♂ Krabin, C. Siam, 8. 11. 15.

♀ Krabin, C. Siam, 9. 11. 15.

♀ Krabin, C. Siam, 12. 11. 15.

Mr. Herbert's specimens are all of this race of 'Tree-Pie.

Hume gives three features by which *assimilis* can be distinguished from its nearest ally *himalayensis*; (1) paler brown ear-coverts, contrasting with black ring round eye; (2) brown of sides of neck and back concolorous with ear-coverts; (3) comparatively pale throat. There is an enormous series of *D. sinensis* in the British Museum, and using the above features, I find that it is quite impossible to divide *assimilis* from *himalayensis*, though the throat of the latter is generally decidedly darker than in the former. *Assimilis*, however, can be distinguished at a glance by the much paler upper plumage, and this is quite sufficient to retain it as a good sub-species.

The Chinese bird, *D. s. sinensis*, differs from the *himalayensis* group in its wholly dark tail.

4. CRYPSIRHINA VARIANS.

Corvus varians, Lath. Ind. Orn. Sup., p. xxvi (1801).

2 ♂ 1 ♀ Samkok, C. Siam, 21. 8. 1915.

♂ Samkok, C. Siam, 4. 7. 1915.

2 ♂ Klong Wang Hip, P. Siam, 1. 10. 15.

♂ ♀ Klong Wang Hip, P. Siam, 3. 10. 15.

♂ Krabin, C. Siam, 9. 11. 15.

A fine series of these beautiful little Magpies, which Mr. Herbert records as common in many parts of Siam, breeding in practically every place where it occurs, making a rather shallow cup-shaped nest with thorny twigs on the outside and lined with the tendrils of a vine,

often in thorn bushes, and laying four eggs quite corvine in their general appearance.

5. *PLATYSMURUS LEUCOPTERUS* (Temm.).

Glaucapis leucopterus, Temm. pl. Col. No. 265 (1824).

♂ ♀ Klong Bang Lai, P. Siam, 31. 1. 1916.

♀ Klong Wang Hip, P. Siam, 6. 10. 15.

All three of the specimens obtained by Mr. Herbert are very large birds with wings over 203 mm.

6. *MELANOCHLORA SULTANEA FLAVOCRISTATA*.

Parus sultaneus, Hodg. Ind. Rev. 1836, p. 31.

♀ Klong Bang Lai, P. Siam, 2. 1. 16.

♀ Klong Wang Hip, P. Siam, 4. 10. 15.

♂ Pak Jong, E. Siam, 29. 11. 15.

All three of these specimens belong to this sub-species, having their wings, the male 108 mm. and the females 95 and 102 mm., respectively. *M. s. sultanea* has a wing between 110 and 115 mm. *Flavocristata* forms a very poor sub-species.

7. *GARRULAX LEUCOLOPHUS DIARDI*.

Turdus diardi, Less. Tr. d'Orn. p. 408 (1831).

1 unsexed, Hup Bon, S. E. Siam, 19. 7. 15.

♂ Hup Bon, S. E. Siam, 24. 7. 15.

2 ♂ 1 ♀ Krabin, C. Siam, 6. 11. 15.

It should be noted that birds from the Shan States and Annam are far nearer to *G. l. belangeri* than to the conspicuously white-bellied birds from Siam, and the specimens from the former countries in the British Museum labelled *diardi* should all rather be referred to *belangeri*. Roughly the distribution of the three races appears to be as follows:—

Garrulax l. leucolophus. India, Assam, Manipur, Arrakan and North Chin Hills.

G. l. belangeri. Yunnan, N. and S. Shan States, Annam, Lower Chin Hills, Pegu and Tenasserim.

G. l. diardi. Extreme South Yunnan, Siam, Cambodia and Cochin China, rarely extending into Eastern Tenasserim, and then in a somewhat intermediate form approaching *belangeri*.

8. GARRULAX MONILIGER MOUHOTI.

Garrulax mouhoti, Sharpe, Cat. B., B. M. vii. p. 443 (1883).

Garrulax moniliger leucotis, Baker, Bull. B.O.C. 1917, No. cexxvii, p. 8.

1 not sexed, Hup Bon, S. E. Siam, 18. 7. 15.

♂ Chan Teuk, E. Siam, 13. 8. 15.

♂ ♀ Krabin, C. Siam, 9. 11. 15.

♂ ♀ Krabin, C. Siam, 11. 11. 15.

Kloss has recently ("Ibis" 1918, p. 232) rightly placed, in this subspecies, two specimens obtained by him at Lat Bua Kao. When first examining the specimens of *Garrulax moniliger* in this collection, the three Cambodian specimens named *mouhoti* by Sharpe could not be found, and as Mr. Herbert's birds did not agree with Sharpe's description, yet were quite different to Indian birds, I unfortunately named them *leucotis*, which now becomes a synonym of *mouhoti*.

There are still, however, three races of *moniliger*, as the Indian and Northern Burmese bird is quite distinct from the South Burman and Malayan bird, whilst this again is absolutely different from that of Siam and the countries further East. As these other races may possibly be also found in Siam, the one in North-West and the other in South-West Siam, I briefly describe them here.

Garrulax moniliger moniliger, which is found in India and Northern Burma, has white tips to the tail feathers and black ear-coverts with a small white central patch.

G. m. fuscata (Baker, Bull. B.O.C. 1918, No. ccxxxiii, p. 64.) has dusky rufous tips to the tail feathers, and the ear-coverts almost wholly white with black tips. This and the last two sub-species are both rather pale coloured birds, *fuscata* being a trifle darker and redder than *moniliger*, though the difference is but slight.

This form is found in Southern Burma and Malaya.

G. m. mouhoti is distinguishable at a glance from both the two last by its much darker, richer plumage, both above and below. The ear-coverts are as in *fuscata*, but the tails are even more broadly and darkly tipped than in that bird.

In nidification all three races resemble one another, making the same bulky cup of grass, leaves, bents and other odds and ends, lined with fine roots. In the Northern forms the full complement of

eggs is three or four and rarely even five; in the Southern form it appears to be generally two, sometimes three

9. *EUPETES MACROCERCUS GRISEIVENTRIS*.

Baker, Bull. B.O.C. No. cccxvii, p. 8 (1917).

♂ Tung Song, P. Siam, 17. 9. 15. Type.

♀ Tung Song, P. Siam, 16. 9. 15. Type.

♂ Tung Song, P. Siam, 24. 9. 15.

These three specimens, which are all adult birds in perfect condition, differ from any of the very large series in the British Museum in having a much greater extent of the abdomen grey, of a pure slaty-blue tone. There is one bird in the Tring Museum which has more grey on the abdomen than any of the British Museum birds, but even this has not nearly so much as the Siam specimens.

Peninsular Siam is somewhat of an extension of the range of this remarkable genus, which until recently had not been found further North than Province Wellesley in the Malay Peninsula.

10. *POMATORHINUS OLIVACEUS SIAMENSIS*.

Baker, Bull. B. O. C., No. cccxvii, p. 9 (1917).

♂ ♀ Maprit, P. Siam, 27. 12. 15. Types.

♀ Maprit, P. Siam, 8. 1. 16.

♂ ♀ Klong Bang Lai, P. Siam, 18. 1. 16.

This sub-species is very much darker than either *P. o. olivaceus* or *P. o. ripponi*, and has also a still darker tail in comparison with the rest of the upper plumage. The differences are only a question of degree of darkness, and can hardly be appreciated unless in actual comparison between skins.

From Hartert's *fastidiosus* it differs in having richer, and more extensive red on the flanks, and in being somewhat redder above.

11. *POMATORHINUS NUCHALIS KLOSSI*.

Baker, Bull. B. O. C., No. cccxvii, p. 9 (1917).

♀ Samkok, C. Siam, 16. 6. 15.

Differs from *P. nuchalis nuchalis* in being very much darker, and in having the rufous of the flanks and sides of the neck a deeper richer chestnut. The upper and lower aspects of the tail are almost black, and much darker in contrast to the back than it is in *P. n. nuchalis*. Again, in this latter bird, the colour of the head is quite

different to, and much darker and greyer than, the back, whereas in *P. n. klossi* these parts are practically concolorous.

I should not have named this bird from the single specimen obtained by Mr. Herbert, but I find that two birds collected by Mr. C. Boden Kloss at Klong Menao, S. E. Siam, fully bear out the above diagnosis.

Dimensions as in *P. n. nuchalis*.

12. PELLORNEUM RUFICEPS SUBOCHRACEUM.

Pellorneum subochraceum, Swinhoe, A. M. N. H. (4) vii. p. 257 (1871).

♀ Hup Bon, S. E. Siam, 23. 7. 15.

3 ♂ Klong Wang Hip, P. Siam, 3-10. 10. 15.

♀ Krabin, C. Siam, 14. 11. 15.

2 ♂ Pak Jong, E. Siam, 29. 11. & 1. 12. 15.

♂ Maprit, P. Siam, 10. 1. 16.

♂ Klong Bang Lai, P. Siam, 29. 1. 16.

This fine series of Tit-Babbler from so many localities is very consistent throughout, and quite typical of the sub-species in all its characters.

13. DRYMOCATAPHUS NIGRICAPITATUS.

Brachypteryx nigricapitata, Eyton, P.Z.S. 1839, p. 103.

♂ Tung Song, P. Siam, 21. 9. 15.

This single specimen calls for no special remark.

14. CORYTHOCICHLA BREVICAUDATA LEUCOSTICTA.

Corythocichla leucosticta, Robinson, Journ. Fed. Mal. States Mus, p. 104 (1914).

Corythocichla brevicaudata herberti, Baker, Bull. B.O.C. No. ccxxvii, p. 10 (1917).

♂ Tung Song, P. Siam, 16. 9. 15.

I unfortunately overlooked *leucosticta* when comparing this specimen, and described it as a new sub-species, but, as Kloss has pointed out ("Ibis," October 1918), it is undoubtedly nothing more than *leucosticta*. Whether *leucosticta* is a sub-species or species is at present doubtful, but it is extremely likely that it will be found breeding in the same area as *C. b. venningi*, and if so, it will have to be raised to the status of a species.

The position of the two genera *Corythocichla* and *Turdinulus*—

if these are not combined under the former name—is very uncertain.

They do not appear to be *Timeliinae* in many ways, and in nidification are very Wren-like as, indeed, they are in habits, and they should perhaps be removed to the Wrens, though even of that group they would be but aberrant members. They, and the genus *Rimator*, would seem to approach *Urocichla* closely in some respects.

15. SETARIA RUFIFRONS.

Malacopteron rufifrons, Cat. Mus. Hein. Th. i. p. 65 (1850).

♂ ♀ Pak Jong, E. Siam, 23. 7. 15.

♂ " " 28. 11. 15.

Kloss in the "Ibis" (1918, p. 203), comments at some length on the name this bird should bear, and on the strength of Finsch's description and measurements (Notes Leyden Mus. xxii. p. 220) considers that the name *rufifrons* must be discarded for Gray's *lepidocephala*. Kloss, however, prefaces his remarks with the statement that he has not seen Cabanis' original description, and he has undoubtedly been misled by Finsch's, which is not correct.

Cabanis describes his bird as follows:—

"Upper side olive-brown, under side whitish, the scale-like feathers of the forehead and anterior crown light reddish with paler shaft-stripes and black tips. Length $6\frac{1}{4}$ in., bill $\frac{3}{4}$ in., wing 3 in., tail $2\frac{1}{2}$ in."

From this we see that the throat is white and the nape not black, whilst the wing is only 76.2 and not 80 mm., as given by Finsch, and so the description is an excellent one, and the name must be retained.

16. MALACOCINCLA ABBOTTI.

Malacocincla abbotti, Blyth, J.A.S.B., xiv. p. 601 (1845).

♂ Samkok, 19. 7. 15.

♀ Hup Bon, S.E. Siam, 23. 7. 15.

♂ Muak Lek, E. Siam, 23. 8. 15.

o ♀ Tung Song, P. Siam, 12-14. 9. 15.

♂ ♀ Klong Wang Hip, P. Siam 3-7. 10. 15.

♂ ♀ Pak Jong, E. Siam, 29. 11. 15.

♀ Maprit, P. Siam, 30. 12. 15.

♂ Klong Bang Lai, P. Siam, 22. 1. 16.

After a very careful examination of a great mass of material, it does not seem possible to distinguish between typical *M. abbotti* and Strickland's *M. olivaceum*. Some birds from as far N.E. as Mymensingh agree perfectly in all respects with others from the south of the Malay Peninsula. Kloss gives the Southern limit of true *abbotti* as Penang, but he too seems to consider that the difference between the two forms is of the slightest.

17. *TURDINUS MACRODACTYLUS MACRODACTYLUS*.

Malacopteron macrodactylus, Strick. A. M. N. H, xiii. p. 417 (1841).

2 ♂ Tung Song, P. Siam, 18-19. 9. 15.

Both of these specimens are distinctly browner, less rufous in tint than are the great majority of birds from the Southern Malay States, and agree exactly with those obtained by Davison at Klang. They may possibly constitute a new sub-species, but as there are one or two specimens in the British Museum collection which come from Malacca and cannot be separated in appearance from Herbert's and Davison's birds, I do not give them a name.

18. *THRINGORHINA GUTTATA*.

Turdinus guttatus (Tick), Blyth, J.A.S.B. xxvii. p. 414 (1859).

♂ ♀ Tung Song, P. Siam, 22. 9. 15.

♂ Maprit, P. Siam, 28. 12. 15.

♂ ♀ Klong Bang Lai, P. Siam, 18. 1. 16.

The eggs of this bird have not been taken, but they will assuredly prove to be white like those of its nearest ally, the Assam bird *T. oglii*. This genus is very closely allied to *Stachyris*, and its nomenclature, as far as is known, confirms this opinion. It will be interesting to find whether the nest and eggs of *guttata* yet further corroborate it.

19. *ANUROPSIS MALACCENSIS*.

Brachypteryx malaccensis, Hartl. Rev. Zool. 1844. p. 402.

♀ Tung Song, P. Siam, 18. 10. 15.

♀ Tung Song, P. Siam, 2. 10. 15.

20. *ALCIPPE PHAEOCEPHALA MAGNIROSTRIS.*

Alcippe magnirostris, Walden, Blyth's B. of Burma, p. 115 (1875).
Alcippe davisoni, Harington, Journ. B. N. H. S. xxiii. p. 453 (1915).

4 ♀ Tung Song, P. Siam, 20-26. 9. 15.

♂ Klong Bang Lai, P. Siam, 14. 1. 16.

Mr. Herbert's specimens together with a good series in the British Museum suffice to shew that Harington's *davisoni* cannot be sustained. The extent of the markings on the head and hind neck appears to vary individually, and not according to any geographical distribution. Even in Mr. Herbert's small series the variation is very noticeable, and there is no doubt Harington's *davisoni* must be suppressed and become a synonym of *magnirostris*.

21. *STACHYRIS POLIOCEPHALUS.*

Timalia poliocephala, Temm. Pl. Col. pl. 593 fig. 2 (1836).

♀ Tung Song, P. Siam, 17. 9. 15.

22. *STACHYRIS NIGRICEPS DAVISONI.*

Stachyris davisoni, Sharpe, Bull. B. O. C. I. p. 7 (1892).

♂ Tung Song, P. Siam, Sept. 15.

This specimen agrees perfectly with others from the Malay Peninsula. *S. n. davisoni* is probably found throughout the greater part of Siam, as a second specimen from another district of Siam in the Tring Museum has, I think, correctly been referred to it by the late Col. Harington.

23. *STACHYRIDOPSIS RUFIFRONS OBSCURA.*

Baker, Bull. B. O. C. No. cexxvii. p. 10. (1917).

2 ♂ 1 ♀ Klong Bang Lai, P. Siam, 20. 1. 16.

This quite distinct new form is nearest to *S. r. poliogaster*, but is paler above and the red on the crown is less deep. The lores and cheeks are fulvous instead of grey; the fulvous on the breast brighter, paler and much more pronounced. The abdomen and flanks are grey as in that sub-species.

The British Museum possesses a good series of *poliogaster*, so that fortunately comparison is easy.

It is rather curious that one should find in Siam a form separated from its nearest ally by a wide stretch of country occupied by less closely connected races.

24. *MIXORNIS SUMATRANA RUBRICAPILLUS*.

Mixornis sumatranus, Bp. Conop. Av. i. 850. p. 217.

Stachyridopsis sulphurea, Rippon, Bull. B. O. C. xi. p. 11.

2 ♀ Chan Teuk, E. Siam, 12. 8. 15.

♂ ♀ Pak Jong, E. Siam, 20. 8. 15.

♂ Tung Song, P. Siam, 26. 9. 15.

2 ♂ Klong Wang Hip, P. Siam, 4-9. 10. 15.

♂ Klong Bang Lai, P. Siam, 7. 11. 15.

♀ Maprit, P. Siam, 2. 1. 16.

3 ♂ Klong Bang Lai, P. Siam, 22-28. 1. 16.

♂ Krabin, C. Siam, 28. 1. 16.

Kloss in the "Ibis" 1918 p. 204 describes certain birds under the name *Mixornis rubricapilla sulphurea*. When Col. Harington was writing his notes on the Indian Timeliidae we together examined the type of that bird in comparison with the huge series of this species in the British Museum, and satisfied ourselves that Rippon's *S. sulphurea* could not possibly be separated from *Mixornis rubricapilla*. These little birds differ *inter se* to a very great extent, and we found it most difficult to divide them into races. Rippon's type is a bird which might well have been killed in Bengal, and agrees perfectly with specimens from that Province and from Assam. Specimens from the extreme West are noticeable for the small amount of red on the heads, and might possibly form a new sub-species, but as we found similar instances amongst birds from Burma, Shan States and Siam, Harington wisely refrained from making another.

Kloss rightly points out that *sumatrana* is the oldest name for any form of this species, and it should therefore be adopted as the specific name, other names ranking as sub-specific only.

Kloss' *Mixornis sumatrana connectens* is possibly sustainable as a race; from Burma to Sumatra the breast stripes appear to become steadily heavier and blacker, and the head and back more rufescent. Into how many races the species should be divided is doubtful, and should depend on what areas are really inhabited by a distinct and constant form.

25. *CYANODERMA ERYTHROPTERUM SORDIDA*.

Baker, Bull. B. O. C. cxxvii. p. 10 (1917).

2 ♂ Klong Wang Hip, P. Siam, 4. 10. 15.

♀ Maprit, P. Siam, 22. 12. 15.

Messrs. Robinson and Kloss ("Ibis" 1918, p. 10) doubt the validity of this sub-species, but it is quite easily distinguished. The whole plumage above and below is considerably darker than in *C. e. erythrop-terum*. The red is deeper and less bright, the breast a darker, almost blackish grey, and the belly less albescent. The two birds are similar in size

26. TURDINULUS EPILEPIDOTUS GRANTI.

Turdinulus granti, Richmond, Proc. U. S. Nat. Mus. 1900, p. 320.

♂ ♀ Tung Song, P. Siam, 19. 9. 15.

The pair of birds obtained by Mr. Herbert fully confirms Richmond's diagnosis of the differences between this race and its nearest allies.

27. ZOSTEROPS PALPEBROSA AUREIVENTER.

Zosterops aureiventer, Hume Str. Feath. vi. p. 519 (1878).

♂ Meklong, C. Siam, 26. 6. 15.

This bird agrees well with typical *aureiventer* in its bright pale yellow-green upper plumage, purer pale under plumage, and brilliant yellow lores and forehead. The three races *palpebrosa*, *simplex* and *aureiventer* all run into each other in the most perplexing manner, and over a much larger area than is usual with birds intermediate between geographical races, and consequently they are often very difficult to determine. This particular individual has its head brighter and paler than the upper back, a characteristic also found in Hainan birds; it also has the yellow stripe down the abdomen fairly well developed.

28. HERPORNIS XANTHOLEUCA.

Erpornis xantholeuca, Hodgs, J. A. S. B. xiii. p. 380 (1844).

♀ Hup Bon, S. E. Siam, 20. 7. 15.

2 ♂ 1 ♀ Tung Song, P. Siam, 25-27 9. 15.

I can detect no differences between specimens from Siam, and those described by Hodgson from Nepal. The White-bellied Herpornis does not seem to be darker in Siam than in India and Burma, a distinctive character which is so often found in Siamese birds.

29. AETHORHYNCHUS LAFRAYESNII.

Iora lafrayesnii, Hartl. Rev. Zool. 1844 p. 401.

♂ Chan Teuk, E. Siam, 10. 8. 15.

- ♀ Pak Jong, E. Siam, 21. 8. 15.
 o ♂ Klong Wang Hip, P. Siam, 4-23. 10. 15.
 ♂ Maprit, P. Siam, 1. 1. 16.
 ♂ Hup Bon, S. E. Siam, 25. 1. 16.
 2 ♂ Klong Bang Lai, P. Siam, 26. 1. 16.

These birds appear to be quite typical *lafrayesnii*, and I find that Sharpe's *xanthotis* cannot possibly be retained. Neither does his key appear to be correct. *Xanthotis* is said to be a smaller bird, yet in his series of *lafrayesnii* in the British Museum there are specimens both larger and smaller than his type of *xanthotis*, and the same is the case in Mr. Herbert's series. The green is no more a yellowish green in *xanthotis*, than it often is in *lafrayesnii*. The wing margins do appear to be somewhat conspicuous, but even in this feature they are equalled by specimens from Malaya and elsewhere. The ear-coverts vary very greatly in different individuals, and this character is of no value either specifically or sub-specifically.

30. AEGITHINA TIPHIA TIPHIA.

Motacilla tiphia, Linn. S. N. 1, p. 331 (1766).

- ♀ Samkok, C. Siam, 21. 6. 15.
 ♀ Meklong, C. Siam, 26. 6. 15.
 ♀ Sansep, Bangkok, 4. 7. 15.
 o Klong Wang Hip, P. Siam, 30. 10. 15.
 ♀ Bangkok, 17. 12. 15.
 ♂ Maprit, P. Siam, 2. 1. 16.
 ♂ Bangkok, 8. 3. 16.

The bird obtained at Bangkok in March is in breeding or semi-breeding plumage, with brilliant yellow throat and breast, and a good deal of black on the back, especially on the nape and hind neck. The forecrown is green. A further series of males in full breeding plumage would be interesting, and as the bird is very common in Siam, should be easy to get. Mr. Herbert took several nests in Bangkok in March, and has very kindly given me eggs. These are strikingly different to any I have seen taken in India or Burma. The ground colour is pure white, quite untinged with grey, pink or yellowish, as seems to be invariably the case in eggs taken in those countries, and the markings

consist of small spots and blotches, which, though slightly inclined to be longitudinal in character, in no case resemble the long straggling blotches always found in eggs taken outside Siam. The superior spots are brick-red in colour, the secondary ones are lavender and pinkish neutral tint. They average in size 17.0 x 13.0 mm., almost exactly, and are therefore also decidedly smaller than those of our Indian birds.

[*Note.* The above description of the eggs represents a very general type, but the straggling blotches or writing marks, as if made with a very broad pen, are quite common, and I have one example of the two types found in the same nest. E. G. HERBERT.]

31. AEGITHINA VIRIDISSIMA.

Iora viridissima, Bonap. Consp. Av. i. p. 397 (1850).

♀ Klong Bang Lai, P. Siam, 19. 1. 16.

This also is a bird of which a big series would be interesting to examine.

32. CHLOROPSIS MALABARICA INORNATA.

Chloropsis aurifrons inornatus, Kloss, Ibis, 1918 p. 198.

♂ ♀ Chan Teuk, E. Siam, 9. 7. 15.

♂ Muak Lek, E. Siam, 23. 7. 15.

♂ ♀ Krabin, C. Siam, 30. 10. and 2. 11. 15.

The males are noticeable in that they have either no yellow, or very little, on the sides of the neck and on the breast below the black. They bear out, therefore, Kloss' description in this respect of his new sub-species, though I had refrained from describing the form as new on these grounds, until it was certain that the alleged differences were constant.

33. CHLOROPSIS CHLOROCEPHALA CHLOROCEPHALA.

Phyllornis chlorocephalus, Walden, A. M. N. II. (4) vii. p. 241 (1871).

4 ♂ Hup Bon, S. E. Siam, 17-27. 7. 15.

2 ♂ 3 ♀ Tung Song, P. Siam, 13-23. 9. 15.

♂ Maprit, P. Siam, 4. 1. 16.

Mr. Herbert's specimens form a fine series of this beautiful *Chloropsis* in many stages of plumage.

34. CHLOROPSIS ZOSTEROPS.

Chloropsis zosterops, Vigors, App. Nen. Life. Raff. p. 674 (1830).
 5 Klong Wang Hip, P. Siam, 8. 10. 15.

35. IRENA PUELLA PUELLA.

Coracias puella, Lath. Ind. Orn. i. p. 171 (1790) (Hab. in India).
 2 ♂ 3 ♀ Hup Bon, S. E. Siam, 16-21. 7. 15.
 2 ♂ ♀ Tung Song, P. Siam, 13-24. 9. 15.
 ♀ Krabin, C. Siam, 17. 11. 15.
 ♂ 3 ♀ Hinlap, E. Siam, 6-9. 12. 15.
 ♂ ♀ Klong Bang Lai, P. Siam, 16-17. 1. 16.

These specimens are all typical *puella*. In most cases the tail-coverts, both upper and lower, are quite short, and in none do they reach to within one inch of the tip of the rectrices.

As regards measurements, *cyanea* cannot be distinguished from *puella*, though the latter is generally a good deal bigger than the former. On the other hand the British Museum collection contains two birds which are smaller than any specimen of *cyanea*. The wings of *puella* run from 110 up to 133 mm. and those of *cyanea* from 111 to 123 mm. only.

36. CRINIGER PALLIDA PALLIDA.

Criniger pallidus, Swinh. Ibis, 1870, p. 252.
 2 ♂ ♀ Tung Song, P. Siam, 16-24. 9. 15.
 ♂ Maprit, P. Siam, 28. 12. 15.
 2 ♂ Klong Bang Lai, P. Siam, 14-23. 1. 16.

At the first glance the series obtained by Mr. Herbert in Siam appeared to be darker, less yellow and more reddish ochraceous than the series in the British Museum from Hainan, but though there may possibly be a very slight difference between the two series, on an average there are so many individuals in each which agree exactly with one another that an additional sub-species seems to be neither justified nor necessary.

The wings of Mr. Herbert's 7 specimens vary in length from

102 to 109 mm., all but one being under 105 mm. The Hainan specimens in the British Museum vary from 98 to 105 mm.

The form found in Yunnan, which I have recently named *grandis* (Bull. B. O. C. cccxxvii. p. 10, 1917), is a much bigger bird, the length of wing ranging from 114 to 119 mm.

37. TRICHOLESTES CRINIGER.

Brachypodius (?) *criniger*, A. Hay, Blyth, J. A. S. B. xiv. p. 577 (1845).

♂ Tung Song, P. Siam, 24. 9. 15.

A quite typical specimen.

38. HEMIXUS CINEREUS.

Iole cinerea, Blyth, J. A. S. B. xiv. p. 573 (1845).

2 ♂ 3 ♀ Tung Song, P. Siam, 22-26. 10. 15.

These specimens seems to be, on the whole, a purer grey than birds from the south of the Malay Peninsula, but they can be matched here and there by a few individuals, so for the present I refrain from naming them.

39. OTOCOMPSA EMERIA EMERIA.

Lanius emeria, Linn. S. N. i, p. 137 (1766).

3 ♂ 5 ♀ Klong Wang Hip, P. Siam, 30. 9 to 7. 10. 15.

♀ Krabin, C. Siam, 5. 11. 15.

♂ Maprit, P. Siam, 9. 1. 16.

2 ♂ Klong Bang Lai, P. Siam, 20. 1. 16.

As a series, these birds are typical *emeria* and are not so dark and richly coloured as birds from Assam and the North-West hills of Burma.

40. OTOCOMPSA FLAVIVENTRIS JOHNSONI.

Rubigula johnsoni, Gyldenstolpe, Kungl. Sv. Vet. Akad. Hand-L. 1 No. 8 p. 25. Pl. i. fig. 3 (1915).

Otocompsa flaviventris minor, Kloss, Ibis 1918, p. 200.

2 ♂ Hup Bon, S. E. Siam, 15-27. 7. 15

2 ♂ Pak Jong, E. Siam, 16-19. 8. 15.

o ♀ Klong Wang Hip, P. Siam, 2-7. 10. 15.

2 ♂ 2 ♀ Krabin, C. Siam, 3-14. 11. 15.

♀ Pak Jong, E. Siam, 1. 12. 15.

3 ♂ 2 ♀ Hinlap, E. Siam, 8-9. 12. 15.

♂ ♀ Klong Bang Lai, 16-20. 1. 16.

This magnificent series of no less than 18 specimens of Gyldenstolpe's Bulbul is most interesting, as it shews (Kloss points this out also, "Ibis" 1918, p. 201) that this bird is nothing but a sub-species of the Indian Black-headed Yellow Bulbul, *Otocompsa flaviventris*. Of the above specimens the majority have not attained the wonderful crimson-scarlet throats possessed by the fully adult bird in complete plumage, the throats being all black as in typical *flaviventris*. Indeed, so exact is the resemblance between *O. f. johnsoni* and small *O. f. flaviventris* that I found four Siam specimens of the former, in a box of the latter in the British Museum collection.

The red throats are not sexual, for males and females alike possess them. It is almost certainly a sign of age however, for all the specimens which have no red on the throat have the black feathers of this part rather sparse and ragged, and possibly the complete red throat is not fully developed until the bird is two years old. In one instance of four birds shot all together at Hinlap on the 8th December, two have red throats and two have black, shewing no trace of red. Another specimen has the throat entirely black except for one red feather.

A few specimens in Mr. Herbert's series have the yellow of the underparts tinged with bronze, but a similar character occurs in *flaviventris* here and there over the whole of its range, and is conspicuous in specimens in the Museum from Simla and Assam. On the whole the upperparts of *O. f. johnsoni* are a darker, deeper olive-yellow than in *O. f. flaviventris*, but the difference is not sufficient to rely on.

Kloss (*loc. cit.*) has named a Yellow Bulbul from Koh Lak, S. W. Siam, *O. f. minor* on account of its smaller size. Mr. Herbert's series shews, however, that Gyldenstolpe's Bulbul is quite common in S. W. Siam, and we cannot, of course, have two sub-species of a resident bird in the same area. Kloss bird can therefore, only be a young *johnsoni*, an opinion in which he would doubtless have concurred had he had Mr. Herbert's birds before him for examination.

41. TRACHYCOMUS OCHROCEPHALUS.

Turdus ochrocephalus, Gm. Sys. Nat. i, p. 821 (1788).

2 ♀ Klong Wang Hip, P. Siam, 29. 9. and 4. 10. 15.

This appears to be almost the Northern limit of this Bulbul's habitat.

42. RUBIGULA WEBBERI.

Isidia webberi, Hume Str. Feath. 1879 pp. 40, 63.

3 ♂ Tung Song, P. Siam, 18-28. 9. 15.

The three specimens of this beautiful little Bulbul call for no remark.

43. IOLE MALACCENSIS.

Hypsipetes malaccensis, Blyth, J. A. S. B. xiv. p. 574 (1845).

♀ Tung Song, P. Siam, 13. 10. 15.

44. IOLE VIRESCENS LONNBERGI.

Criniger lonnbergi, Gylden, Kungl. Sv. Vet. Akad. Hand-L. 56. No. 2 p. 68.

♂ Muak Lek, E. Siam, 23. 8. 15.

♂ Pak Jong, E. Siam, 14. 12. 15.

♂ Hinlap, E. Siam, 10. 12. 15.

♂ ♀ Klong Bang Lai, P. Siam, 25-28. 1. 16.

Mr. Herbert's series of this Bulbul fully bears out Gyldenstolpe's description of his new race. The wings measure from 83 to 89 mm., whereas the largest bird to be found in a very long series of *Iole virescens virescens* or amongst my new *Iole v. cinnamomeoventris* is one of 82 mm., whilst in all the others it is below 80 mm. *C. lonnbergi* differs also from the former in having the under tail-coverts cinnamon instead of yellow, and from the latter in being more yellow below and more green above.

45. PYCNONOTUS FINLAYSONI FINLAYSONI.

Pycnonotus finlaysoni, Strick. A. M. N. II. (1) xiii. p. 411 (1844).

2 ♂ Hup Bon, S. E. Siam, 24. 7. and 1. 9. 15.

♂ Pak Jong, E. Siam, 19. 8. 15.

2 ♂ Muak Lek, E. Siam, 23-25. 8. 15.

3 ♀ Klong Wang Hip, P. Siam, 30. 9. and 4. 10. 15.

- ♂ Krabin, C. Siam, 6. 11. 15.
 ♂ Maprit, P. Siam, 4. 1. 16.
 2 ♂ Klong Bang Lai, P. Siam, 28. 1. 16.

46. PYCNONOTUS BLANFORDI.

Pycnonotus blanfordi, Jerdon, Ibis 1862 p. 20.

- ♂ Sansep, Bangkok, 3. 7. 15.
 2 ♀ Krabin, C. Siam, 8-14. 11. 15.
 9 ♂ 3 ♀ Bangkok, 6-11. 3. 16.
 ♂ Samkok, C. Siam, 17. 3. 16.

I find it impossible to discriminate between *P. b. blanfordi* and *P. b. robinsoni*. There is an immense series of this species in the British Museum collection containing the two alleged races, and a most careful examination of this material does not confirm the supposed differences when they are sorted out into geographical areas.

47. MICROPUS MELANOCEPHALUS MELANOCEPHALUS.

Lanius melanocephalus, Gm. S. N. i. p. 309 (1788).

- ♂ Krabin, C. Siam, 9. 3. 15.
 ♂ Hup Bon, S. E. Siam, 27. 7. 15.
 3 ♂ o Klong Wang Hip, P. Siam, 29. 9. to 8. 10. 15.
 ♂ 2 ♀ Krabin, C. Siam, 5-14. 11. 15.
 2 ♂ Klong Bang Lai, P. Siam, 26-31. 1. 16.

Mr. Herbert's series of this Bulbul is quite typical, individuals varying in the same way and to the same degree as they do elsewhere. It is noticeable, however, that there are no specimens of *M. (m) cinereiventris* in Mr. Herbert's collection. As a general rule where one is found the other is always also to be met with, almost invariably the two together in company, and I believe the latter to be merely an aberrant form of the former.

48. SITTA FRONTALIS FRONTALIS.

Sitta frontalis, Horsf. Trans. L. S. xiii. p. 162 (1821).

Sitta frontalis saturator, Hartert.

- 3 ♂ Klong Wang Hip, P. Siam, 23. 9. to 2. 10. 15.

I cannot divide Hartert's *saturator* from typical *frontalis*. The variation amongst individuals from the same locality, and even from

the same flock, is so great, that extremes of variation can be obtained from the same area if a sufficiently large series is available for examination. In the present instance, of the three birds collected by Mr. Herbert, two are quite typical *frontalis*, whereas the third specimen is an equally typical *saturation*. The series under the name of *saturation* in the British Museum consists, with one exception, of very poor, dingy skins; the one clean exception, however, is no darker than are other skins of *frontalis* from Assam, Sikkim and Ceylon. Certainly the white on the throat of these three Siam birds is very restricted, but not more so than in some specimens from the countries already named, and this characteristic seems of little, if any, more value than the others.

49. *DICRURUS ANNECTENS SIAMENSIS*.

Dicrurus annectens siamensis, Kloss, Ibis, 1918, p. 226.

♂ Tung Song, P. Siam, 23. 10. 15.

♀ Krabin, C. Siam, 2. 11. 15.

Kloss has recently (*loc. cit.*) described the form of Crow-billed Drongo found in Siam as new, and has given it the name of *D. a. siamensis*. The character on which he founds his sub-species is the alleged smallness of its bill, which measures in breadth at the nostrils 8.7 mm. and in height at the chin 8.5 mm. The two birds obtained by Mr. Herbert undoubtedly confirm Kloss' diagnosis, as far as they go; the bird obtained at Krabin, a place some eighty miles E. N. E. of Bangkok, has a very small bill of only 8.3 mm., and the other specimen from Tung Song, about 400 miles S. of that place in Peninsular Siam, has a huge bill of no less than 10.3 mm. On the other hand I find that there is an immense range of variation in specimens from practically every portion of the area inhabited by this species, from the Himalayas to the extreme South. In nearly every district the range in variation of breadth is from 9.5 to 11.5 mm., but if an average is taken, it is very level throughout.

For the present, therefore, I retain the smaller of these birds under Kloss' name *siamensis*.

50. *DICRURUS LEUCOGENYS*.

Buchanga leucogenys, Walden, A. M. N. H. (4) v. p. 219 (1870).

♀ Maprit, P. Siam, 28. 12. 15.

2 ♀ Maprit, P. Siam, 1-4. 1. 16.

♂ Bangkok, 8. 3. 16.

Siam birds seem to be quite typical. Young birds are much darker than adult ones, and have considerably less white—indeed, in the youngest birds it is hardly present at all.

The present small series contains specimens of the darkest young birds, and the whitest adults.

51. DICRURUS LEUCOPHAEUS DISTURBANS.

Dicrurus leucophaeus disturbans, Baker, Nov. Zool. 1918, vol. xxv. p. 293.

♀ Pak Jong, E. Siam, 2. 12. 15.

The specific name for all the Drongos of the *longicaudatus*, *cineraceus* and *nigrescens* group must be *leucophaeus* of Vieillot.

I have recently written a note on this species in "Novitates Zoologicae" (vol. xxv. p. 293, 1918), and have nothing to add to what I have there recorded. A large series from Siam is still a desideratum, in order to enable us to see to what extent this sub-species varies in depth of colouring.

In Northern and Central Siam the form of Drongo met with will almost assuredly be Oates' *D. l. nigrescens*.

52. CHAPTIA AENEA MALAYENSIS.

Chaptia malayensis, A. Hay, Blyth, J. A. S. B. xv. p. 294 (1846).

2 ♂ Hup Bon, S. E. Siam, 17-25. 7. 15.

♀ Maprit, P. Siam, 9. 1. 16.

As I have already explained in "Novitates Zoologicae" (*vide supra*), I cannot separate the Siamese form from those of Burma, Malay Peninsula and Southern India, and all Mr. Herbert's birds are quite typical of this sub-species. The Hainan birds are a much bigger race.

53. ACROCEPHALUS ARUNDINACEUS ORIENTALIS.

Salicaria turdina orientalis, Temm. and Schleg. Faun. Jap. Aves, p. 50 (1850).

2 ♀ Samkok, C. Siam, 16. 3. 16.

54. ORTHOTOMUS SUTORIUS MACULICOLLIS.

Orthotomus maculicollis, Moore, P. Z. S. 1854. p. 309.

♂ Samkok, C. Siam, 22. 6. 15.

♀ Hup Bon, S. E. Siam, 15. 7. 15.

♂ Krabin, C. Siam, 11. 11. 15.

All three of these birds appear to be true *maculicollis* and are identical with specimens from the Malay Peninsula. The dark upper parts and the black bases of the breast feathers are very pronounced.

55. ORTHOTOMUS RUFICEPS.

Edela ruficeps, Less. Traité d'Orn. p. 309 (1831).

♂ Maprit, P. Siam, 29. 12. 15.

♀ Maprit, P. Siam, 2. 1. 16.

Both birds are quite typical specimens.

56. CISTICOLA CURSITANS CURSITANS.

Sylvia cisticola, Temm. Man. d'Orn. 2nd ed. i. p. 228 (1820).

♀ ♂ juv. Bangkok, 18. 6. and 11. 7. 15.

♀ Samkok, C. Siam, 20. 6. 15.

♂ ♀ Sansep, Bangkok, 3. 7. 15.

♂ juv. Muak Lek, E. Siam, 25. 8. 15.

♂ 2 ♂ juv. ♀ juv. Samkok, C. Siam, 29-31. 8. 15.

2 ♂ ♀ Samkok, C. Siam, 16-17. 3. 16.

The series of Fantail Warblers obtained by Mr. Herbert's collector appears to be all typical *cursitans*, but an immense amount of work still remains to be done, both in regard to working out the geographical races of this little bird and also its nomenclature. Such a work unfortunately entails far more time than can be devoted to it under present circumstances, so I leave them provisionally under this name.

They agree with other specimens from Northern Peninsular Siam and Burma, Tenasserim and Western Burma.

57. CISTICOLA EXILIS? VOLITANS.

Calamanthella volitans, Swinh. Journ. N. China As. Soc. p. 226 (1859).

♂ 2 ♀ Bangkok, 10. 7 and 29. 8. 15.

2 ♂ 2 ♀ Samkok, C. Siam, 31. 8. 15.

The male, killed on the 29th August, is in female plumage.

These birds, like the last, I name only provisionally as *volitans*, a species described originally from Formosa, and from which these birds only differ in the two cocks having rather more richly coloured heads. A very large series of males in breeding plumage for each

month of the year, or say from April to September, from every part of its range, is absolutely necessary before the various forms of *exilis* can be worked out. In the Williamson collection sent home in 1915—now unfortunately broken up between different museums—there was a really excellent series of males from Siam, grading from the richly-coloured birds with golden chestnut heads killed in late spring, to pale washed-out specimens with pale yellowish, or yellowish-white heads killed in August and September. From this series it was possible to shew small series typically representing *C. exilis exilis*, *C. exilis tytleri* and *C. exilis volitans*. It would appear from Mr. Williamson's birds that their colours bleach very quickly in the summer, and many of the alleged sub-specific differences may eventually prove to be nothing more than seasonable changes.

58. FRANKLINIA RUFESCENS.

Prinia rufescens, Blyth, J. A. S. B. xvi. p. 456 (1847).

♀ Maprit, P. Siam, 2. 1. 16.

♀ juv. Tung Song, P. Siam, 15. 12. 15.

I cannot see any difference between these specimens and typical birds from Assam. Birds from further South in the Malay Peninsula are generally darker.

59. PHRAGMATICOLA AEDON.

Muscicapa aedon, Pall. Reise, iii. p. 695 (1776).

♀ Maprit, P. Siam, 30. 12. 15.

A specimen in perfect plumage.

60. GRAMINICOLA BENGALENSIS STRIATA.

Styan, Bull. B. O. C. 1892. p. 6.

4 ♂ 2 ♀ Samkok, C. Siam, 29-31. 8. 15.

All these specimens agree perfectly with Styan's *striata* described by him from Hainan. They differ from typical *bengalensis* of India and Burma in having the lores, ear-coverts and supercilia pale fulvous rather than grey, in having the upper parts much less heavily marked with black, especially on the head, so that the general appearance is paler and more rufous. In *striata*, also, the white tips to the tail feathers are dull and narrow, whereas in *bengalensis* they are wide and conspicuous. The latter difference is not so noticeable in birds in worn plumage, as the tails in both species become very abraded.

61. MEGALURUS PALUSTRIS.

Megalurus palustris, Horsf., Trans. Linn. Soc. xiii. p. 159 (1820).

3 ♂ 2 ♀ Bangkok, 18-30. 6. 15.

♀ Sansep, Bangkok, 3. 7. 15.

♂ Samkok, C. Siam, 16. 3. 16.

These specimens are quite typical and cannot be distinguished from Assam birds, though they are mostly in very worn plumage. Mr. Herbert found this bird breeding freely round about Samkok, the nests being generally placed in dense tufts of grass. He took a fine series of the eggs in June and July, these differing in no way from those found elsewhere, but in one or two clutches he found five eggs, which is exceptional in other parts of this bird's range.

62. ABRORNIS SUPERCILIARIS SCHWANERI.

Sylvia schwaneri, Temm. in Mus. Lugd. undé. (Blyth, Ibis 1870. p. 169).

1 ♂ 2 ♀ Klong Bang Lai, P. Siam, 14-26. 1. 16.

♀ Klong Wang-Hip, P. Siam, 2. 10. 15.

All Herbert's birds agree well with typical *schwaneri* from Borneo, though the heads are even darker and in still greater contrast with the colour of the back. It should be noted that typical *superciliaris* is confined to the Himalayas as far East as the Mishmi Hills. Birds from the hills South of the Brahmapootra are somewhat intermediate, but are nearer *A. s. schwaneri* than *A. s. superciliaris*. Thus the range of the former sub-species must be taken as extending from Assam, South of the Brahmapootra, through Cachar, Manipur, Chin Hills, and the whole of Burma, Western Siam, and the Malay Peninsula to Borneo.

In the Cat. Birds British Museum, the wing of *schwaneri* is said to be 1.85 inches only, but this is quite incorrect, for the series measures from just over 2 inches (51.0 mm.) up to 2.2 inches (55.8 mm.), the latter measurement being that of Bornean specimen.

63. PHYLLOSCOPUS HUMEI PRAEMIUM.

P. humei praeium, Mathews and Iredale, Aus. Avian. Record iii. p. 44 (1915).

3 ♂ Krabin, C. Siam, 7-13. 11. 15.

♂ Pak Jong, E. Siam, 1. 12. 15.

2 ♂ Hinlap, E. Siam, 6-10. 12. 15.

♂ ♀ Samray, Bangkok, 16-17. 12. 15.

♂ ♀ Klong Bang Lai, P. Siam, 26-27. 1. 16.

Mathews and Iredale have pointed out (*loc. cit.*) that *Motacilla superciliosa* (Gmelin 1789) cannot be used for this little Warbler; *superciliosa* being unavailable, *humei* now becomes the specific name and a trinomial being necessary they have given it the name of *praemium*.

64. PHYLLOSCOPUS OCCIPITALIS CORONATUS.

Ficedula coronata, Temm. and Schleg, Faun. Jap. Aves. p. 48 (1847).

♀ Tung Song, P. Siam, Sept. 1915.

A quite typical specimen of this sub-species.

65. PHYLLOSCOPUS BOREALIS BOREALIS.

Phyllopneuste borealis, Blas. Naum. 1858. p. 313.

♂ Tung Song, P. Siam, 18. 9. 15.

66. PHYLLOSCOPUS BOREALIS SCANTHODRYAS.

Phylloscopus xanthodryas, Swinh. P. Z. S. 1863. p. 296.

♂ Klong Song, near Petriu, C. Siam, 29. 2. 16.

The two above specimens must without doubt be placed under the names as shewn. In the former the first primary is very small, smaller in fact than it is in many birds obtained from their usual breeding haunts, whilst, on the other hand, the first primary in the second specimen is unusually big even for that sub-species. Both are, of course, migrants breeding in different areas and meeting here during the winter migration.

67. UROSPHEMA SQUAMICEPS.

Tribura squamiceps, Swinh. P. Z. S. 1863. p. 292.

♂ Maprit, P. Siam, 27. 12. 15.

This is another instance of this Warbler wandering from its usual migration routes, though it has been obtained in Burma even further West than this.

68. PRINIA INORNATA HERBERTI.

Baker, Bull. B. O. C. 1918. No. cccxxx. p. 39.

♀ Samkok, C. Siam, 20. 6. 15. Type.

♂ Bangkok, 5. 7. 15. Type.

♂ Pak Jong, E. Siam, 20. 8. 15.

2 ♂ ♀ Samkok, C. Siam, 29. 8. 15.

It was with no little surprise that when I came to examine the series of *Prinia* in Mr. Herbert's collection, I saw at once that they belonged to some form with which I was quite unacquainted.

One would naturally have expected something closely allied to *P. i. blanfordi*, its nearest neighbour in Tenasserim and the peninsular portion of Siam itself. It seems, however, to have nothing to do with this very rufous race, but to be nearest to *P. i. burmanica*, the type of which came from Tounghoo. From this latter bird it is easily distinguishable by its much darker upper parts, its paler, less rufescent tone below, and by the very big dark spots at the tips of the tail feathers.

In addition to the differences in colour, it is also a much bigger bird. The type of *burmanica* has a wing of 51 mm., but is an exceptionally big bird, the average of 8 specimens being only 47.5 mm., whilst the average of 9 birds collected by Messrs. Williamson and Herbert is exactly 53 mm. The tails average 55 mm. in *burmanica* and 64.5 mm. in *herberti*. The bills of the two races measure respectively 12 and 15 mm.

This Warbler seems to be extraordinarily common round about Bangkok, and both Mr. Williamson and Mr. Herbert have been fortunate enough to obtain good series of their nests and eggs, some of which they have been so kind as to give to me.

The nest is described as being every similar to that of other members of this species, i.e., a long purse-shaped nest with the entrance near the top, woven from very fine strips of grass and lined with the same; it measures about 5 to 7 inches in length by $2\frac{1}{2}$ to 3 inches in diameter. It is as a rule attached to the flowering stems of a coarse sedge-like grass growing in or alongside water, or in stretches of low-lying grass-land.

The eggs are amongst the most beautiful known. Instead of having a bright blue ground with chocolate and black blotches like normal eggs of *inornata* and *burmanica*, they are like, but even brighter than, those of *P. i. blanfordi*. In ground colour they vary from a pale creamy white to a deep reddish pink, boldly blotched and spotted with blood-red, chocolate red and blackish red, profusely

scattered over their whole surface. In most eggs the blotches are very large, in a few cases four or five covering half the surface of the eggs. Rarely the markings are smaller and more scanty, and are sometimes confined almost entirely to the larger end. Scrolls and wavy lines, such are so common in eggs of Jerdon's Wren-Warbler (*Prinia i. jerdoni*) and, to a less extent, in those of the Common Wren-Warbler, are very seldom present in these eggs.

In shape they are broad obtuse ovals, with a very glossy compact surface, and the texture, though fine, is very stout for such small eggs.

30 eggs average 15.6 x 11.5 mm. The longest, which is also the broadest, measures 17.3 x 12.2 mm.; the shortest is 14.9 x 11.3 mm., and the most narrow 15.4 x 11.0 mm.

They lay principally in May, June and July, but many will be found breeding as late as August and September, and others again as early as April.

69. *LANIUS NIGRICEPS LONGICAUDATUS.*

Lanius longicaudatus, Ogilvie Grant, Nov. Zool. ix. p. 480 (1902).

3 ♂ ♀ and ♂ juv. Bangkok, 18-30. 6. 15.

These birds belong to Grant's sub-species *longicaudatus*, the form found over the greater part of Siam.

70. *LANIUS CRISTATUS CRISTATUS.*

Lanius cristatus, Linn. Syst. Nat. i. p. 134 (1758).

♀ Sapatoom, Bangkok, 14. 3. 16.

A very worn specimen. This bird, of course, is a migrant only in Siam.

71. *HEMIPUS PICATUS PICATUS.*

Muscicapa picata, Sykes, P. Z. S. 1832. p. 85.

♂ Hup Bon, S. E. Siam, 23. 7. 15.

♂ Pak Jong, E. Siam, 21. 8. 15.

2 ♂ Klong Wang Hip, P. Siam, 29. 9. 15.

♂ ♀ Maprit, P. Siam, 10. 1. 16.

♂ Klong Bang Lai, P. Siam, 1. 2. 16.

These little Shrikes appear all to be quite typical *picatus*. As

yet that erratic bird *obscurus* has only been obtained from Peninsular Siam, where Messrs. Williamson and Aagaard have procured specimens at Bang Nara, Patani. It will be interesting to know how far North it occurs.

72. *TEPHRODORNIS PELVICUS* (? subsp. nov.)

Tentheca pelvica, Hodg. Ind. Rev. i. p. 447 (1837).

♂ Hup Bon, S. E. Siam, 25. 7. 15.

This is a very dark grey specimen, differing from all other specimens I have seen of *T. p. pelvica* in having the back decidedly darker, more grey and less rufous; it also differs in having the whole of the throat, breast and flanks ashy grey, faintly tinged with vinous.

Kloss² is, I understand, shortly describing the Malay form under a new name, but as regards the British Museum series, there seem to be only the following races, (1) one Indian, (2) doubtfully Burmese and Malayan birds, which may be slightly darker, and (3) Chinese birds which are, of course, much richer and redder, and which may well be found in N. E. and extreme East Siam. I cannot distinguish between Chinese and Hainan birds.

More material is required before the Siam bird can be given a definite position, and for the time being I leave it unnamed.

73. *PERICROCOTUS SPECIOSUS FRATERCULUS*.

Pericrocotus fraterculus, Swinh. Ibis, 1870, p. 244.

3 ♂ 2 ♀ Hup Bon, S. E. Siam, 17-26. 7. 15.

3 ♂ Tung Song, P. Siam, 15-23. 8. 15.

2 ♂ Klong Wang Hip, P. Siam, 1-4. 9. 15.

♂ ♀ Maprit, P. Siam, 1-6. 1. 16.

These specimens are all typical *fraterculus*. The wings measure from 89 to 96 mm.

74. *PERICROCOTUS PERIGRINUS*.

Parus perigrinus, Linn. Sys. Nat. i. p. 342 (1766).

♀ Bangkok, 16. 6. 15.

♂ Krabin, C. Siam, 30. 10. 15.

4 ♂ 5 ♀ Bangkok, 14. 12. 15.

* Since this was written Kloss' articles have appeared in the "Ibis," but there is nothing referring to this bird.

There are, undoubtedly, several races of this little Minivet, and I hope shortly to be able to work them out, but have not yet had time to do so.

75. PERICROCOTUS CINEREUS.

Pericrocotus cinereus, Lafresn. Rev. Zool. viii. p. 94 (1845).

♂ Paknam, C. Siam, 14. 2. 16.

A very battered specimen.

76. CAMPOPHAGA NEGLECTA.

Volvocivora neglecta, Hume. Str. Feath. v. p. 203 (1877).

♀ Tung Song, P. Siam, 18. 9. 15.

♂ ♀ Klong Wang Hip, P. Siam, 3-8. 10. 15.

In a recent article in the "Ibis" (1918, p. 192) Kloss has revived the name *polioptera* of Sharpe, on the grounds that three birds obtained by the former at Koh Lak shew that his original diagnosis was correct, and that *polioptera* is a different race to typical *neglecta*. Sharpe, however, himself altered his opinion later on, and agreed with Oates that the two supposed forms were one and the same, and as regards the three actual specimens named *polioptera* in the British Museum collection, there can be no doubt but that they are simply young *neglecta*. This is confirmed by the three additional specimens obtained by Herbert, these also being nothing but *neglecta*.

77. CAMPOPHAGA MELANOSCHISTA INTERMEDIA.

Volvocivora intermedia, Hume, Str. Feath. v. p. 205 (1877).

♀ Pak Jong, E. Siam, 30. 10. 15.

This specimen is very pale in general colouration, with pure white under tail-coverts and a wing of 121 mm. It agrees exactly with the specimens in the British Museum named *intermedia* by Hume, some of which have pure white under tail-coverts, whilst some have them white with greyish bases. This forms quite a good geographical race, and must be maintained.

Kloss' new species *Volvocivora koratensis* (Ibis 1918, p. 193) is nothing more than Hume's bird, Kloss not having Hume's specimens for comparison, and being misled by Hume's insufficient description. *V. koratensis* becomes, therefore, a synonym of *C. m. intermedia*.

78. *GRAUCALUS MACEI SIAMENSIS*.

Baker, Bull. B. O. C. 1918. No. cexxxiii. p. 69.

♂ Chan Teuk, E. Siam, 15. 8. 15.

♂ ♀ Krabin, C. Siam, 5. 10. 15.

♂ Klong Song, near Petriu, C. Siam, 29. 2. 16.

The male birds collected by Mr. Herbert have wings varying from 192 to 195 mm., and are exceptionally big specimens. The single female is in moult, and the imperfect wings measure only 158 mm. They belong to the form found all over Burma, Siam and Eastern Assam, in which the adult female acquires a unicoloured chin, throat and upper breast, as in the male, instead of having these parts barred as in the females of India and Ceylon.

79. *ARTAMUS FUSCUS*.

Artamus fuscus. Vieill. Nouv. Dict. d'Hist. Nat, xvii. p. 297 (1817).

♂ et ♂ juv. Samkok, C. Siam, 21. 6. 15.

Throughout its great range—from Ceylon to Simla, and from Manipur to Amherst and Bangkok—I can find no geographical variation in this bird entitling it to division into sub-species. Specimens from Peninsular Siam and Tenasserim appear to be very slightly paler on the under surface than are birds from elsewhere, but the difference is so trifling that it would not be justifiable to separate them on this account alone.

In size the birds vary considerably individually, but on an average are much the same from all parts of their habitat. Birds from Ceylon are no smaller than those from extreme Northern India, and Southern Burmese specimens are practically as big as those from Manipur and Assam.

80. *ORIOLOUS INDICUS TENUIROSTRIS*.

Oriolus tenuirostris. Blyth, J. A. S. B. xv. p. 48 (1846).

♀ juv. Krabin, C. Siam, 1. 11. 15.

♂ juv. Klong Bang Lai, P. Siam, 25. 1. 16.

Both specimens in this collection are young birds without any indication of the distinctive black nape band, but the amount of yellow on the tail feathers and their rather slender bills seem to refer them to the sub-species named. Both *O. indicus indicus* and *O. indicus*

tenuirostris occur in Siam, the latter as a resident, and the former as a winter visitor only. The latter is only a resident sub-species of the former, the sedentary bird already shewing by its shorter wing the effects of its giving up its migratory habits.

It will be seen that I retain the name *indicus* for this Oriole. The original description is that of Aldrovandus (viii. p. 862, 1599), in which he gives a very good description of this bird, but replaces the black by blue. As Jerdon points out this is probably a clerical error only, for the accompanying plate figures unmistakably a Black-naped Oriole. Its habitat is given as "in India," and I have no doubt it refers to the present species. Brisson, referring to Aldrovandus (Ornithology ii. p. 328, 1760, and in Buffon's Planches Eluminées p. 281, 1774), of course repeats the error, and substitutes blue for black.

81. ORIOLOUS LUTEOLUS THAIACOUS.

Oriolus luteolus thaiacous, Hartert, Bull. B. O. C. No. cccxxiii. p. 63, and No. cccxxiv. p. 75.

♂ Chan Teuk, E. Siam, 15. 8. 15.

♂ Krabin, C. Siam, 20. 10. 15.

3 ♀ Krabin, C. Siam, 11-16. 11. 15.

♀ Klong Bang Lai, P. Siam, 28. 1. 16.

Hartert has shewn ("Novitates Zoologicae" 1918, p. 361) that the proper name for this Oriole is *luteolus* of Linnaeus 1758, who first gave it the name of *Sturnus luteolus*, but later in the xii. ed. (1766) changed it to *Oriolus melanocephalus*.

82. EULABES INTERMEDIA.

Gracula intermedia, A. Hay. Madr. Journ. Linn. Soc. xiii. pt. ii, p. 157 (1844).

♂ Hup Bon, S. E. Siam, 17. 7. 15. Lat. 12°. Long. 100° about.

♂ ♀ Krabin, C. Siam, 29. 10. 18. Lat. 14°. Long. 102° about.

♂ ♀ Krabin, C. Siam, 2. 11. 15.

83. EULABES JAVANENSIS.

Corvus javanensis, Osbeck, Voy. to China, i. p. 157 (1771).

♂ Pak Jong, E. Siam, 17. 8. 15. Lat. 10. 50°. Long. 99° about.

♀ Klong Wang Hip, 2. 10. 15. Lat. 8°. Long. 99° about.

♂ ♀ Maprit, P. Siam, 4-10. 1. 16.

♂ Klong Bang Lai, P. Siam, 17. 1. 16.

These two series of Grackles are most interesting, and confirm Oates' description of the two birds and the differences between them in a remarkable degree. The birds obtained North of latitude 12° are all *intermedia*, with wings averaging about 160 mm., and with bills about 23.5 mm. long and 11.5 mm. deep at the nostrils.

Those obtained South of lat. 12° are all *javanensis*, having a wing of about 170 mm., with bills about 26 mm. long and 14.5 mm. deep.

In the latter birds the yellow lappets under the eye are all completely divided by a narrow line of feathers, whilst in the former there is a well-defined space of yellow wattle joining these two areas at their lowest edge.

At the same time we as yet know of no definite boundary line between the two forms, and it appears as if they both bred in the central area in which the two forms are found together. If this is so they cannot be relegated to the rank of sub-species, as one would have expected, and this remains a very interesting conundrum for our Siamese Field Naturalists to work out.

Birds from the Andamans and Nicobars approach most nearly to *javanensis* in their long stout bills, but have the ear lappets as in *intermedia*, thus adding to the difficulty of deciding what status the two forms should hold.

84. STURNIA SINENSIS.

Oriolus sinensis, Gmel. Sys. Nat. i. p. 394 (1788).

♂ Krabin, C. Siam, 6. 11. 15.

♀ Bangkok, 14. 3. 16.

3 ♂ 3 ♀ Samkok, C. Siam, 18. 3. 16.

I cannot find that there is any difference in these birds throughout their range, beyond the fact that Hainan birds appear to be very small.

A large series of birds from China have an average wing measurement of 102 mm.

A smaller series from the Malay Peninsula average 101.75 mm., 3 from Formosa average 100.6 mm., but 5 birds from Hainan only 94.0 mm. These latter will probably have to be separated, though I can see no difference except in size. The birds from the remaining areas certainly cannot be split up into races.

85. STURNIA NEMORICOLA.

Sturnia nemoricola, Jerdon, Ibis, 1862, p. 22.

♂ ♀ Krabin, C. Siam, 30. 10 to 8. 11. 15.

86. AGROPSAR STURNINUS.

Gracula sturnina, Pall. Reis. Russ. Reichs. iii, p. 695 (1776).

♂ 2 ♀ Krabin, C. Siam, 29. 10 to 5. 11. 15.

The male is in full and perfect plumage, but the two females appear to be still immature.

87. AMPELICEPS CORONATUS.

Ampeliceps coronatus, Blyth, J. A. S. B. xi. p. 194 (1842).

♂ 3 ♀ Hinlap, E. Siam, 8. 12. 15.

3 ♂ 2 ♀ Klong Bang Lai, P. Siam, 17-19. 1. 16.

Details as to this bird's habits and nidification still require to be ascertained. The only clutch of eggs known was brought in to Dr. Coltart with the parent bird by Trans-Dikku Nagas at Margherita in Assam, and though probably correct, is not altogether beyond suspicion. The eggs are blue, like those of *Sturnia*, but of a hard, very glossy texture, more like the eggs of some of the Laughing Thrushes rather than those of the Mynas. These were said to have been taken from a hole in a tree.

88. GRACULIPICA NIGRICOLLIS.

Gracula nigricollis, Payk. Stockh. Acad. Hand-L. xxviii, p. 291 (1807).

♂ Bangkok, 18. 6. 15.

89. GRACULIPICA LEUCOCEPHALA LEUCOCEPHALA.

Acridotheres leucocephalus, Gigl. and Salv. Atti. R. Acc. Sc. di Tor. v. p. 273 (1870).

♂ ♀ Krabin, C. Siam, 16. 11. 15.

Wells has recently described [Bull. B. O. C. No. cexlii, p. 77 (1919)] a new race of this Myna from Annam, but the type of *leucocephala* is from Siam, and Mr. Herbert's birds are quite typical. The

Burmese form must be known as *incognita* of Hume (Str. Feath.), being different to the Siam bird, having a brown head and other minor differences.

90. ACRIDOTHERES TRISTIS.

Paradisea tristis, Linn. Syst. Nat. i. p. 167 (1766).

♂ Bangkok, 30. 6. 15.

♂ Samkok, C. Siam, 30. 8. 15.

Both birds are in very poor condition, and a series of good specimens, more especially from Eastern Siam, is a desideratum.

91. AETHIOPSAR FUSCUS GRANDIS.

Acridotheres grandis, Moore, Horsf. and M. Cat. ii. p. 537 (1858).

2 ♂ ♀ Samkok, C. Siam, 20. 6 and 30. 8. 15.

2 ♀ Meklong, C. Siam, 26. 6. 15.

2 ♀ Bangkok, 11. 7. 15 and 14. 3. 16.

All Mr. Herbert's specimens of this Myna are of the same deep black colour as Swainson's types, which he recorded—undoubtedly in error—as having been received from Sumatra. This is quite a different bird to the much paler, browner form found in Manipur and Northern Burma, which approaches *Ae. fuscus fuscus* in colour, though it is so much bigger than that bird. This bird I have recently described under the name of *Aethiopsar fuscus infuscatus* (Bull. B. O. C. No. cccxxiii, 1918. p. 70).

92. STURNOPASTOR CONTRA ? FLOWERI.

Sturnopastor floweri, Sharpe, Bull. B. O. C. viii. p. 17 (1897).

♂ Bangkok, 11. 7. 15.

♂ Samkok, C. Siam, 3. 7. 15.

Both specimens are in very worn abraded plumage, but they seem to be a very pale brown, and more skins of this very common bird should be obtained and sent home for comparison.

93. SIPHIA PARVA ALBICILLA.

Muscicapa albicilla, Pall. Zoogr. Rosso-Asiat. i. p. 462 (1811).

Krabin, C. Siam, 4. 11. 15.

♂ ♀ Bangkok, 16. 12. 15 and 29. 2. 16.

This bird is, of course, only a winter visitor to the lowlands, and it is not at present known to breed anywhere in the Siamese hills, but almost certainly does so in the higher Kachin hills.

94. HEMICHELIDON FERRUGINEA.

Hemichelidon ferruginea, Hodgs. P. Z. S. p. 32. (1845)

2 ♂ ♀ Tung Song, P. Siam, 5-25. 12. 15.

95. CYORNIS TICKELLI SUMATRENSIS.

Cyornis tickelli sumatrensis, Hartert, Nov. Zool. ix. p. 549 (1902).

♂ Pak Jong, E. Siam, 18. 8. 15.

3 ♂ ♀ Klong Wang Hip, P. Siam, 29. 9-13. 11. 15.

♀ Krabin, C. Siam, 10. 11. 15.

96. CYORNIS MAGNIROSTRIS COERULIFRONS.

Cyornis magnirostris coerulifrons, Baker, Bull. B. O. C. No. cexxxvi. p. 8. (1918).

♂ Klong Bang Lai, P. Siam, 24. 1. 16. (Type).

♀ Klong Bang Lai, P. Siam, 14. 1. 16. (Type).

2 ♂ Klong Bang Lai, P. Siam, 15 and 31. 1. 16.

This beautiful little flycatcher is exactly like the Northern *C. m. magnirostris*, except in being decidedly smaller and in having a proportionately rather smaller bill.

Mr. Herbert's three males vary from 70 to 72 mm. in wing measurement, as against 78 to 83 mm. in the larger bird, whilst his female has a wing of 69 mm. against 73 to 78 mm. in the female of true *magnirostris*. The bill, measuring in a straight line from the feathers of the forehead to the tip, varies in the new sub-species between 11 and 11.5 mm., whereas in true *magnirostris* the female has it about 13.5 mm. (13 to 13.75 mm.) and the male about 14.2 mm. (14 to 14.75 mm.).

The range of this race is as yet unknown, but a male in the British Museum collection, from Tenasserim in Burma, seems to belong to it, having a wing of 70 mm. and a bill about 11.2 mm.

97. CYORNIS RUBECULOIDES.

Phoenicura rubeculoides, Vigors, P.Z.S. p. 35 (1831).

♀ Krabin, C. Siam, 7. 11. 15

A quite typical female with bill of 11 mm. and wing of 68 mm. and with dark under-side much suffused on flanks and lower breast with olive. When placed beside the female of *C. t. sumatrensis*, obtained three days later at the same place, Krabin, the differences in plumage are very striking.

98. STOPAROLA MELANOPS.

Muscicapa melanops, Vigors. P.Z.S. p. 171 (1831).

♂ ♀ Hinlap, P. Siam, 6-10. 12. 15.

♀ Maprit, P. Siam, 8. 1. 16.

♂ Klong Bang Lai, P. Siam, 21. 1. 16.

None of these specimens is quite fully adult, but the older of the two males is very noticeably dull in its general colouration.

99. ANTHIPES SUBMONILIGER MALAYANA.

Anthipes malayana, Sharpe, P. Z. S. p. 246 (1888).

3 ♂ 1 ♀ Tung Song, P. Siam, 20-24. 9. 15.

These specimens all seem to be nearest to Sharpe's *malayana*, differing from typical *submoniliger* in having redder foreheads and faces, and the black gorget round the white breast much better defined. At the same time they are not quite so red on the heads as is the type, or the only other specimen of *malayana* in the British Museum collection.

100. ANTHIPES OLIVACEA.

Cyornis olivacea, Hume, Str. Feath. v. p. 338 (1877).

♂ ♀ Tung Song, P. Siam, 15-19. 9. 15.

♂ Maprit, P. Siam, 10. 1. 16.

I cannot see that these specimens differ in any way from typical *A. olivacea*.

101. ALSEONAX LATIROSTRIS.

Muscicapa latirostris, Raffl. Trans. Linn. Soc. xiii. p. 312 (1821).

♂ Tung Song, P. Siam, 28. 9. 15.

2 ♂ ♀ Krabin, C. Siam, 11-31. 10. and 2. 11. 15.

2 ♂ Maprit, P. Siam, 7. 1. 16.

♀ Klong Bang Lai, P. Siam, 14. 1. 16.

This little flycatcher has generally been considered to be merely a migrant within tropical countries, but as a matter of fact it probably breeds throughout the drier portions of the areas in which it is found. General Betham, Col. Buchanan, Major Lindsey Smith and Sergt-Major F. Kemp have all found it breeding in the plains of India, at least as far South as Mhow.

102. *CULCICAPA CEYLONENSIS*.

Platyrrhynchus ceylonensis, Swains. Zool. Ill. ser. L, i, pl. 13 (1820-21).

5 ♂ Tung Song, P. Siam, 15. 9-23. 10. 15.

2 ♀ Klong Song, near Petriu, C. Siam, 29. 2. 16.

103. *PHILENTOMA VELATUM*.

Drymophila velata, Temm. Pl. Col. No. 334 (1823).

♂ Tung Song, P. Siam, 18. 9. 15.

104. *PHILENTOMA PYRRHOPTERUM*.

Muscicapa pyrrhoptera, Temm. Pl. Col. No. 596 (1823).

105. *TERPSIPHONE PARADISI AFFINIS*.

Tchitrea affinis, Hay, Blyth. J. A. S. B. xv, p. 292 (1846).

♀ ♂ Tung Song, P. Siam, 16-23. 9. 15.

♂ Klong Wang Hip, P. Siam, 29. 9. 15.

♀ Samray, Bangkok, 17. 12. 15.

♀ Klong Bang Lai, P. Siam, 14. 1. 16.

The birds in this series all appear to me to be the same as the Burmese form of Paradise Flycatcher. In Eastern Siam other races are found.

106. *XANTHOPYGIA XANTHOPYGIA XANTHOPYGIA*.

Muscicapa xanthopygia, Hay, Madr. Journ. xiii. pt. 2, p. 162.

♂ Tung Song, P. Siam, 16. 9. 15.

This specimen is of the typical form with the throat yellow, not orange, as in *narcissina*, and with the yellow instead of white eyebrow, as in the latter bird.

107. *HYPOTHYMIS AZUREA STYANI*.

Hypothymis styani, Hartl. Abh. Nat. Ver. Bremen. xvi. pt. 2, p. 248 (1898).

3 ♂ Hup Bon, S. E. Siam, 20-25. 7. 15.

♂ 3 ♀ Tung Song, P. Siam, 13-25. 9. 15.

♂ ♀ Klong Wang Hip, P. Siam, 8. 10. 15.

2 ♂ Krabin, C. Siam, 4-5. 11. 15.

♂ Bangkok, 16. 12. 15.

♂ 2 ♀ Maprit, P. Siam, 31. 10. 15 to 12. 1. 16.

♂ Klong Bang Lai, P. Siam, 20. 1. 16.

The Black-naped Blue Flycatchers from the southern parts of Siam all belong to this form, and Mr. Herbert's fine series is very constant in colouration.

108. RHIPIDURA JAVANICA.

Muscicapa javanica, Sparrm. Mus. Carls. iii. pl. 75 (1788).

♀ Samkok, C. Siam, 19. 6. 15.

♀ Samray, Bangkok, 16. 12. 15.

(*To be continued*)

CROCODILUS SIAMENSIS.

BY MALCOLM A. SMITH. F.Z.S.

WITH 3 PLATES.

Crocodilus siamensis was erected by Schneider in 1801, on a skull brought to Europe by the French missionaries to Siam. Mouhot later obtained a young specimen in Cambodia, which is now in the British Museum, and it is also known by one or two specimens from Java. These appear to be the only known records of this creature.

In publishing a list of the crocodiles, chelonians and lizards of Siam in this Journal three years ago, I stated that *C. palustris* Lesson, the Indian "mugger", was an inhabitant of the country, basing my statement upon some juveniles and a dried skin. I have since examined a large number of specimens, both alive and dead, and have discovered my error. The inland or fresh-water crocodile of Siam is *C. siamensis*, and, as I shall presently endeavour to show, *C. palustris* does not exist in the country at all.

Most of the characters which distinguish *C. siamensis* from its allies, *C. palustris* and *porosus*, have already been enumerated, but I propose now to review them in greater detail, and to add some others which have so far escaped observation.

*The head**. 17 or 18 upper teeth on each side, 4 teeth in each premaxillary; 15 lower teeth on each side, the mandibular symphysis extending to the fourth tooth.

Snout from once and two-thirds to once and five-sixths as long as broad at the base; interorbital breadth greater than the vertical diameter of the orbit; a thick, fairly distinct curved ridge, present in most specimens, extending from the anterior extremity of the orbit for a short distance; interorbital ridge, much narrower than the pre-orbital, commencing from in front of a line drawn through the middle of the orbit, and extending to a line drawn across its posterior extremities; in some examples it is very poorly developed. Praemaxillo-maxillary suture on the palate directed backwards.

The integument. One or two pairs of postoccipital scutes. Four large nuchals in a square with a smaller one on each side. Dorsal

*The changes which take place in the skull during growth are considerable, and the proportions given here apply to adults only, or at least half-grown individuals.

shield formed by 16 or 17 transverse, and 4 or 6 longitudinal, series of bony scutes, which are joined to each other in a transverse series, as in *C. palustris*, by suture. In the arrangement of the shields upon the under surface of the body these two species also resemble each other, but differ from *C. porosus*, in that, across the pectoral region, there is a single row of much enlarged scutes (Pl. 6, fig. A.), the shields forming this series being from two to three times as large as those of the adjacent rows. In the diagnosis of juvenile specimens this character is very useful.

The feet. A rudiment of a web between the inner four fingers. Web between the toes much shorter than in *C. palustris* or *porosus*. I have no examples of *C. palustris* suitable for examination, but Mr. Boulenger has kindly examined spirit specimens for me in the British Museum and writes that there is not much difference in palmation between it and *porosus*; in both the web between the 3rd and 4th toes reaches practically the extremity, but it is rather more deeply notched between the 2nd and 3rd toes in *palustris*. In *siamensis* the web between the 3rd and 4th toes does not reach the extremity, while between the 2nd and 3rd toes it barely reaches the 2nd joint of the latter.

This shortness in the web of the toes of *C. siamensis*, as compared with that of *C. porosus*, is well known to the people of Siam, and is commonly used by them to differentiate between the two species, "takhé tin kai" the fowl-footed crocodile, being used for the former, and "takhé tin pet" the duck-footed crocodile, for the latter. Their application of this knowledge, however, is by no means certain, and when confronted with the creature, they are seldom in agreement as to which kind they are actually dealing with.

Dimensions. The largest individual I have actually measured was 3.50 metres in length, and I have never seen any which appeared much bigger, although many that were quite as big. The skull of what seems to be an aged individual in my possession, is no longer than that of the above mentioned example, and 3.50 to 4 metres probably represents the average maximum length of this species. The tail constitutes approximately one half of the total length.

Distribution. Indo-China, Siam, ? the Malay Peninsula, Java.

In Central Siam, upon the Me Yome, Me Ping, and the Prasak rivers, it is still fairly common, although large numbers have been shot by Europeans of recent years. In Northern Siam it appears to be

unknown; although I am informed that a large crocodile was shot on the upper Me Yome, some distance north of Prae, two years ago. On the upper reaches of the Me Kong it does not appear to exist, but further south on that river is well known. I have a skull from Kemarat, lat. 16°. In the peninsula of Siam it is not uncommon in swamps in the neighbourhood of Chumporn, and it is again to be found at the northern extremity of the Talé Sap, near Singgora.

A fresh-water crocodile is also recorded from the following localities, and is probably referable to this species.

Robinson and Annandale (*Fascic. Malay*, 1904, p. 148) report one as common on the upper reaches of the Patani river. South of this there is no direct evidence of the existence of any fresh-water crocodile in the Malay Peninsula.

On the Quaa Noi river, near Sai Yoke, W. Siam, a crocodile is reported as being common.

Last year whilst travelling on the Lang Bian plateau, S. Annam, Monsieur Millet, Conservator of Forests to the French Government, informed me that crocodiles in large numbers existed there in a small lake at Tak-Lak, elevation of about 1000 metres. They were also plentiful in several large swamps in southern Cambodia.

Habits. The Siamese Crocodile is essentially a fresh-water inhabitant, haunting by preference slow-moving streams with muddy banks. Not far north of Paknampo, C. Siam, they have lived for years in the borrow-pits beside the railway embankment, and have become so accustomed to the daily service of trains that they make no attempt to move away when they pass by. At the end of the rainy season, when the whole country is flooded, they are said to disappear, returning again as the waters dry up. Their reason for preferring these pits, in preference to the main river which is not more than a few hundred yards away, is due no doubt to the absence of molestation by passing boats, and also to the greater ease of obtaining food. For the same reason they prefer swamps wherever they are to be found in the vicinity of rivers.

The Siamese Crocodile does not appear to be a particularly aggressive creature. I have never heard of any grown person being attacked by it, although I am told that small children are sometimes seized. The country people certainly seem to have little fear of

them, and do not hesitate to bathe in the waters known to be inhabited by these creatures. They say that as long as they have plenty of fish to eat they will not attack human beings. In captivity their disposition is variable. Some that I have kept have refused all food. Others fed freely on flesh of every kind, and soon learned to come to the side of the tank and take it.

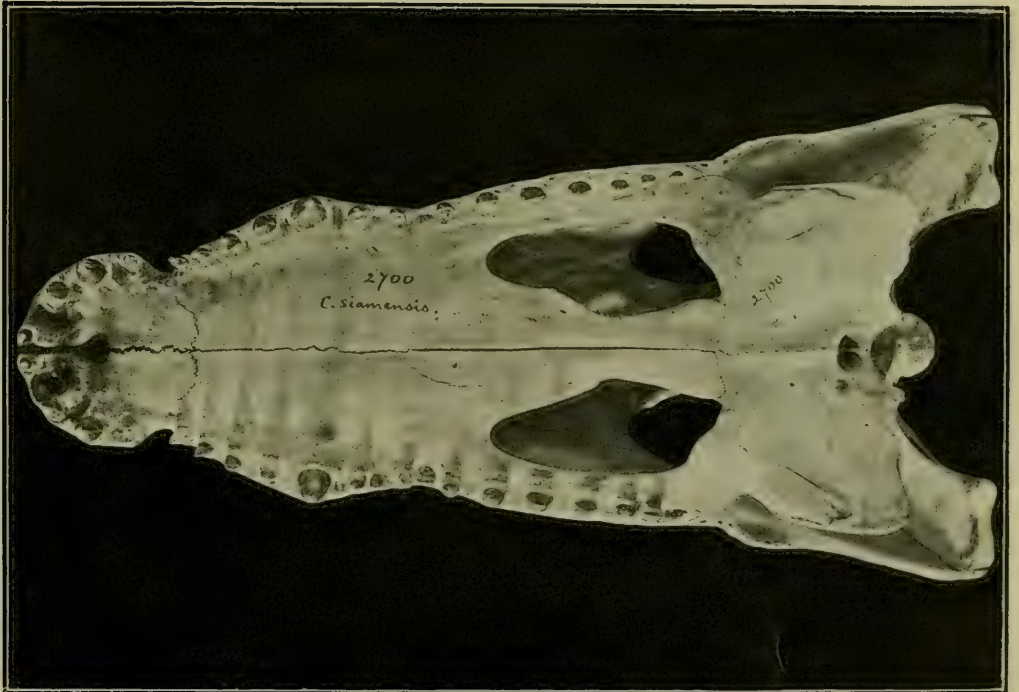
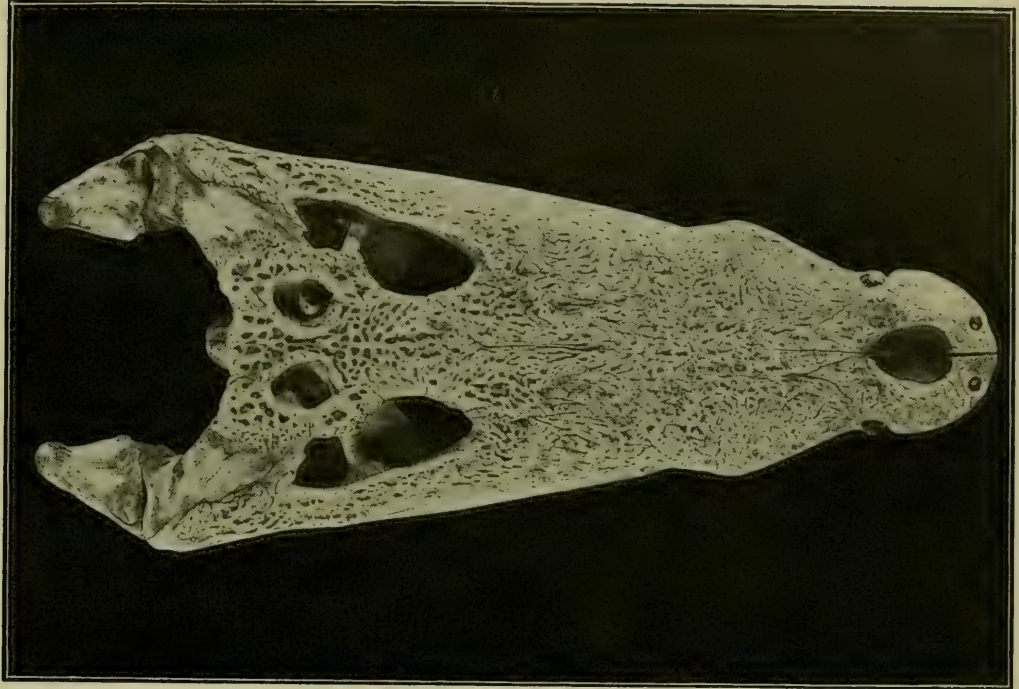
The flesh of this crocodile is eaten by the country people, while that of *C. porosus* is not.

Breeding. Eggs are laid during the rainy season. They have the usual hard, white shell, and are from 75 to 80 mm. long by 50 broad. I have had young ones hatched out in August. When born they were about 250 mm. in total length. They had no teeth at first, but these appeared after some ten days. They were very lively, and snapped fiercely when any attempt was made to handle them.

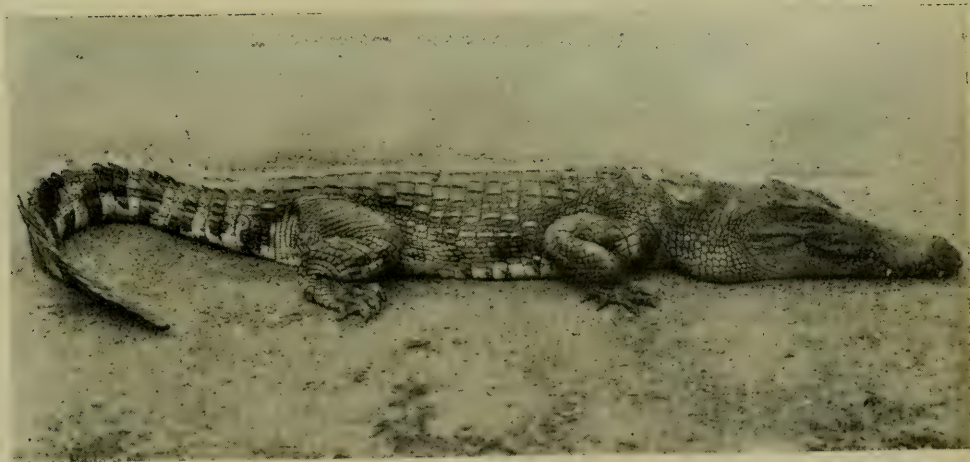
In studying the distribution of *C. siamensis* I have naturally been led to enquire into the exact habitat of its close ally *C. palustris*. This is recorded as India, Ceylon, Burma, the Malay Peninsula and Java; and, if this were correct, one might certainly also expect to find it in Siam.

After carefully examining a large number of crocodiles from various part of Siam, I am convinced that it does not occur anywhere in that country. Nor does there appear to be any reliable evidence that it occurs either in Burma or the Malay Peninsula. Neither the British Museum, the Indian Museum, the Museum of the Bombay Natural History Society nor the F. M. S. Museums, possess specimens from those countries, nor can the authorities of those institutions tell me of any ever having been obtained there. That a fresh-water crocodile exists in Burma is evident from the testimony of eye witnesses who have lived there, but whether it is *palustris* or *siamensis*, still remains to be shewn.

The fresh-water crocodile of the upper part of the Malay Peninsula is almost certainly *C. siamensis*. In fact this form appears to replace *palustris* east of the Indian or Indo-Burmese region. The occurrence of both species therefore in Java, as recorded, is of particular interest.



CROCODILUS SIAMENSIS.



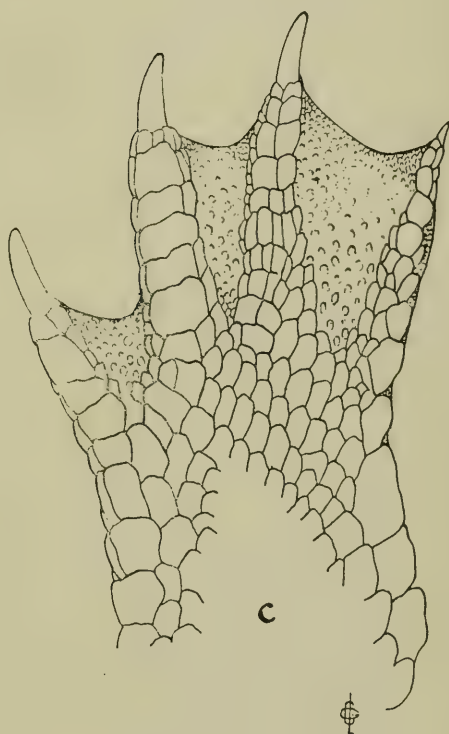
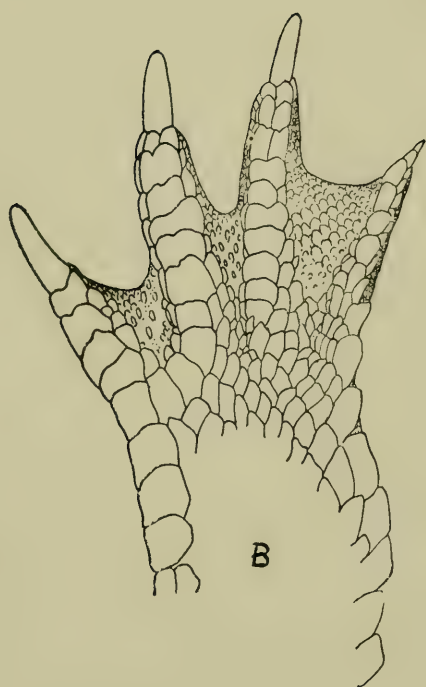
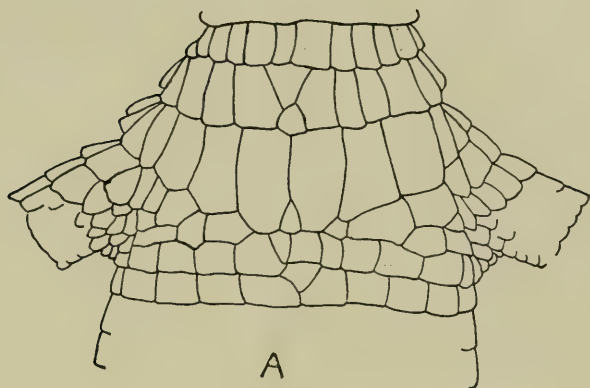
CROCODILUS SIAMENSIS.

LIST OF SPECIMENS OF *Crocodilus siamensis* OBTAINED.

No.	Locality.	Specimen.	Collected by
2699	Utaradit, C. Siam.	Adult, skull.	W. A. R. Wood.
2700	Paknampo, "	" "	M. A. Smith.
2701	Kemarat, Cambodia.	" "	E. Seidenfaden.
2878	Paknampo, C. Siam.	$\frac{1}{4}$ grown, in spirit.	W. Mabert.
3037	" "	Half-grown, stuffed.	"
3038	" "	" "	"
3039	" "	$\frac{1}{4}$ grown, "	S. Ross Greene.
3040	" "	Young ad., flat skin.	M. A. Smith.
3041	" "	$\frac{1}{4}$ grown, stuffed.	S. Ross Green.
3042	" "	Juv., flat skin.	"
3043	" "	" "	"
3044	Chumporn, P. Siam.	" stuffed.	C. D. Switzer.
3078	" "	" skin and skull.	"
3080	Pak Klong, Talé Sap, P. Siam.	Young ad., stuffed.	Arthur Gibb.
3703	Paknampo, C. Siam.	New born, in spirit.	S. Ross Green.
3704	Pitsanuloke, "	Young, "	M. R. Suwabarn Sanitwongse.
3705	Chumporn, P. Siam.	" "	O. C. Daniell.

EXPLANATION OF PLATE 6.

- A. Pectoral shields of *C. siamensis*.
- B. Hind foot of *C. siamensis*.
- C. Hind foot of *C. porosus*.



THE LIZARDS OF THE GENUS *TROPIDOPHORUS* IN SIAM,
WITH DESCRIPTIONS OF TWO NEW SPECIES.

BY MALCOLM A. SMITH, F. Z. S.

Five species of *Tropidophorus* are now known to inhabit Siam, two of which are here described as new to science. *T. thai* was obtained by my collectors at the end of 1917 while on a visit to the North, while *T. robinsoni* was discovered in the Peninsula during the recent expedition of the Federated Malay States Museums to that part of the country. I have much pleasure in naming this new species in honour of Mr. Herbert C. Robinson, Director of Museums, who as head of the party, took charge of my collector. The types of both species will be presented to the British Museum of Natural History.

All the lizards of this Genus appear to have the same love of water, and are to be found frequenting mountain streams, living in the tangle of undergrowth upon the bank, or hiding beneath the stones that form the river bed. They produce their young alive.

Examples of *T. cochinchinensis* I have kept alive, but they were not happy in captivity. The change of environment was evidently too great. Nocturnal in their habits, they spent the days in hiding beneath the earth or stones in their cage. I never saw them take any food.

TROPIDOPHORUS ROBINSONI, sp. nov.

Diagnosis. Upper head shields feebly striated, a single fronto-nasal, 30 to 32 scales round the body, dorsals and laterals keeled, not mucronate. Allied to *T. berdmorei* Blyth, from Pegu and Tenasserim, from which it differs chiefly in the fewer number of scales round the body.

Description. Upper head shields feebly striated; a single fronto-nasal, nearly as broad posteriorly as long; praefrontals forming a good suture; frontal as long as, or a little longer than, the frontoparietals and interparietal together; parietals forming a suture behind the interparietal; four supraoculars, first longest; six supraciliaries anterior to the fourth supraocular, which enters the supraciliary border; nostril pierced in a single nasal; a single anterior loreal, succeeded by another of about the same size; six supralabials, fourth largest and subocular; temporals small and scale-like except one, in contact with the parietal, which is usually much larger; a single postmental;

tympanum nearly as large as the eye opening; 30 to 32 scales round the middle of the body, nuchals often bi- tri- or multicarinate, dorsals strongly keeled, not mucronate; laterals keeled, a little smaller than the dorsals, directed straight backwards; gular scales smooth or feebly keeled, ventrals smooth; a pair of large praeals; caudal scales keeled except the median lower series; the hind limb reaches the wrist, or not quite so far; subdigital lamellae smooth, 17 or 18 beneath the fourth toe.

Brownish or blackish above, with light brown, black-edged cross bars or alternating spots, the first on the nape; sides of body and tail with small white spots; below yellowish-white, the belly uniform, the throat more or less spotted with black, the tail thickly spotted or almost entirely black; head blackish, labials with white spots.

Type. (Gravid female,) author's number, 3254, (collected) at Tasan, 32 kilometres W. of Chumporn town, Peninsular Siam, (in March) 1919.

Number of specimens examined, 33, all from the same locality; author's numbers 3247 to 3279 inclusive.

Variation. The posterior loreal shield in one specimen is divided vertically into two.

<i>Measurements.</i>	No. 3250	No. 3254	No. 3267
Total length	155	165	155
Tail	77	90	95
Length of head	15	15	10
Width of head	9	8.5	8.5
Fore limb	18	16	15
Hind limb	25	25	23

Several gravid females were obtained, containing from four to five embryos, in a fairly advanced stage of development.

TROPIDOPHORUS YUNNANENSIS Blgr.

Annandale has recently proposed (Rec. Ind. Mus., viii, p. 58, 1912), that this species should be united with *T. berdmorei* Blyth, from Tenasserim, basing his opinion on the fact that the keeling of the scales, and the number of scale rows round the body, is inconstant. With a large series of specimens from the hills of Northern Siam before me, however, there seems good reason to maintain them as originally separated by Boulenger.

Altogether I have 42 specimens, 16 from Khao Pleung and Pan Ton Pheung, in the hills to the south of Prae, while the remainder are from the hills in the Me Wang district, reaching as far north as Pa Meang, near the border of the Southern Shan States. They were all taken at between 800 and 2000 feet elevation.

In all the adults and in nearly all the half grown specimens, the scales are entirely smooth. Only in juveniles are they at all strongly keeled, and this seems to be a character common to the genus, namely, that the young when born are more strongly keeled than their parents.

The number of scales round the middle of the body varies from 32 to 36; 32 occurring six times, 34 twenty-seven times, and 36 nine times in the series. This variation does not appear to depend upon locality.

The praefrontals in this species are said to be in contact, or meeting by the inner angles. My specimens shew considerable variation in this respect. In the series of 16 from south of Prae, these shields are so arranged in 11 examples, while in the other 5, a small shield is interposed separating them. In none of the specimens from Me Wang are the praefrontals in contact, this intercalated shield being present in every instance. There are two¹ superposed anterior loreal scales in every example, succeeded by a single large posterior one; rarely one or two small scales are interposed between this latter shield and the praefrontals. Two praeanal shields occur in every example.

TROPIDOPHORUS BERDMORII (Blyth).

To this species I refer 5 examples collected on Doi Nga Chang, in the southern part of the Me Wang district, at between 2000 and 3000 feet.

It is unfortunate that none of these specimens is adult, the largest one having a head and body of 57 mm. (total length, 132, tip of tail missing). All the specimens however, have the dorsal and

¹ Anderson's specimen as figured (Zool. Researches Yunnan, p. 796. pl. lxxvi. fig. 3. 1878). appears to have only a single anterior loreal.

lateral scales strongly keeled, the smallest (head and body, 41 mm.),¹ having the ventrals faintly keeled also.

There are 36 scales round the middle of the body in one individual, 38 in the remaining four. There is a single large anterior loreal, succeeded by another of about the same size. The praefrontals are in contact with each other by their inner angles.

I separate these five examples from my specimens of *T. yunnanensis* on the following points:—

(1) Larger number of scales round the body; (2) dorsals and laterals strongly keeled; (3) a single anterior loreal; (4) praefrontals in contact in all examples.

TROPIDOPHORUS THAI, sp. nov.*

Description of the type. Upper head shields rugose; a pair of frontonasals, each one much longer than broad; a large azygos shield separating the praefrontals and posterior part of the frontonasals; anterior portion of the frontal broken into two pieces, the total length of this shield being as long as the frontoparietals and interparietal together; four supraoculars, first longest; five supraciliaries anterior to the 4th supraocular which enters the supraciliary border; frontoparietals shorter than interparietal, which separates the parietals; nostril pierced in a single nasal; two anterior loreals, succeeded by two larger ones; six supralabials, 4th largest and subocular; temporals small and scale-like, keeled; postmental single; tympanum nearly as large as the eye opening; 33 scales round the body, dorsals and laterals strongly keeled, scarcely mucronate; laterals smallest, the upper rows directed obliquely upwards and backwards; gulars feebly keeled, ventrals smooth; a pair of large preanals; the adpressed limbs fail to meet by the length of the hand; subdigital lamellae smooth, 18 or 19 beneath the 4th toe; tail a little longer than the head and body, all its scales keeled except the median lower series.

Light brown on the back, with a series of oblique yellowish dark-edged V-shaped marks; small light spots on the sides; belly

¹ The tails of these lizards are so frequently mutilated and regrown, that the measurements of total length give no true indication of the size of the creature.

*Thai=Siamese, pronounced Tai.

brownish white, throat paler; lips black with whitish spots; tail above as the back, below mottled white and dark brown.

Allied to *T. cochinchinensis* Dum. & Bib., and *T. grayi* Günth.

Type. Author's number, 3105, collected at Pa Meang, Me Wang, North Siam, in Oct. 1917, at about 2000 feet elevation.

Two more specimens are from the same locality. They differ from the type in the following particulars.

No. 3106. Anterior part of frontal broken into four or five pieces, parietals in contact behind the interparietal, 6 supraciliaries; 36 scales round the body; the adpressed limbs just fail to meet.

No. 3215. Immature. Gular scales strongly, ventrals feebly, keeled; the hind limb reaches the wrist.

<i>Dimensions.</i>	No. 3105	No. 3106	No. 3215
Total length	180	132	96
Tail	95	60	54
Length of head	16	14	
Width of head	12	10	
Fore limb	18	16	
Hind limb	25	24	

TROPIDOPHORUS COCHINCHINENSIS Dum. & Bib.

Tropidophorus microlepis, Günther, Rept. Brit. Ind. p. 76. Pl. x fig. A.

Günther's type of *T. microlepis* (a single specimen) is from Chantaboon (Chartaboum), and no doubt it came from the neighbouring hill of Khao Sebab, where Mouhot tells us he made considerable collections.¹

I have 12 specimens obtained upon this hill, and 7 more which were born in captivity.

Variation. The praefrontals form a good suture in 17 examples, and have a small shield separating them in 2. There are two super-

¹ "Travels in the Central Parts of Indo-China (Siam), Cambodia, and Laos" By Henri Mouhot. The term Cambéja appears to have been used somewhat loosely in the past, and it seems probable that many of Mouhot's specimens labelled with that name really came from Siam. His maps shew that he travelled extensively in Siam and Laos, and only very little in Indo-China.

posed anterior loreals, the upper being the larger, and a series of small scales (3 to 6) between the posterior loreal and the supralabials.¹

There are from 28 to 32 scales round the middle of the body, the laterals being smallest and directed obliquely. Each example has three praeanal shields.

The type of *T. cochinchinensis* is from Cochin China, and was possibly obtained at a considerable distance from Chantaboon. It differs from the type of *T. microlepis*, and from all my specimens, in having only two praeanal shields, and it may be, when more is known about these lizards in Indo-China, that the two forms will have again to be separated.

Two gravid females brought home and kept in captivity gave birth to 7 and 9 young respectively, at the end of April. Total length at birth, 56 to 60 mm., head and body, 26 to 30. Colour, light brown above, with indistinct darker markings; sides blackish with small white spots; below whitish, throat thickly mottled with grey. Ventral scales strongly keeled, the mothers having these shields quite smooth.

¹ Gunther's figure gives only two loreals, an anterior and a posterior.

MISCELLANEOUS NOTES.

No. I.—Notes on two Kingfishers.

The Eastern Pied Kingfisher. *Ceryle rudis leucomelanura*.

Supplementing Mr. Williamson's remarks (Vol. II, p. 330 of this Journal) on the distribution of this bird, I can vouch for its presence in fair numbers on the Petchaburi river in N. lat. 13°, some fifty miles south of Bangkok. On the three rivers best known to me, the Petchaburi, the Meklong and the Me Ping, I have found the distribution of this bird to be governed by the composition of the banks, dry earthen banks being sometimes riddled with nest holes. In the rapids, where the banks are of rock or shale, it is usually absent.

I omitted to get any specimens north of Raheng, but above that point the birds seem bigger and with more pronounced crests.

The Indian Three-toed Kingfisher. *Ceyx tridactyla*.

Mr. Williamson (*op. cit.*, p. 333) records only four specimens of *tridactyla* as having been obtained in Siam. None of these were obtained in heavy jungle, but since 50 % of them came to a bad end, it would seem that they were rather out of their element in the hot sunny plains. In April 1915, at Sai Yoke in western Siam, I had the luck to observe a pair of these diminutive birds, and obtained one, the female. This was in dense jungle at an elevation of 1500 feet, and the pair were fishing in the head of a tiny stream, at no place deeper than an inch or so. They flew up and down to the water, perching and jerking the head in the usual Kingfisher way.

K. G. Gairdner.

January, 1919.

No. II.—Occurrence of the Burmese Barred-back Pheasant
(*Phasianus humiae burmanicus*) near Chiangmai, N. Siam.

Stuart Baker states (Journ. Bombay Nat. Hist. Soc., Vol. XXV, No. 3, p. 357) that the eastern limit of *P. h. burmanicus* is not certainly known beyond the Salwin river.

On 31st March, 1919, I shot an adult male at an elevation of 4350 feet on Doi Sutep, this mountain being situated some five miles west of Chiangmai, Northern Siam, and about 100 miles east of the Salwin.

The bird was seen feeding in the evening, in fairly open oak or pine jungle with a sparse undergrowth of coarse grass.

Measurements: Head and body 370; tail 495; bill 34; wing 221; tarsus 75; spurs 22 mm.

The colours of the soft parts were:—Iris, chestnut brown. Bill, greenish plumbeous. Legs, bluish plumbeous.

K. G. GAIRDNER.

June, 1919.

No. III.—On the Breeding of the toad *Bufo macrotis*.

In northern Siam the breeding season of this toad occurs in late July and early August, when the skin of the male becomes smooth, and changes from dark brown to quite a bright yellow colour, the female retaining her normal characteristics. They are to be found in large numbers in pools in or near small forest streams, the males invariably preponderating. Three or four males may be seen paying very forcible attention to one female. This year when with Mr. R. J. Chaldecott, we found a dead female with both forearms torn off and a large open wound on the belly, and yet there were still three males attached to her. In the same pond there were numerous other groups, consisting of several males with but one female, and the noise they made could be heard a long way off. I at first thought that the bright colouring must assuredly attract the attention of their natural enemies, but when approached they all become silent and looked extraordinarily like dead leaves floating on the water. If the males are separated from the females they very soon resume their normal colouring, but although I kept them for several days, their skin did not become warty, as it is out of the breeding season.

From the above facts I came to the following conclusions:—Firstly, that the colouring of the males is assumed originally as a sexual attraction, and secondly, as the males, when disturbed, make no attempt to escape, they use this colouring as a form of defensive mimicry.

The only other case that I have come across of a batrachian changing colour is that of *Microhyla berdmorei*, in which the red tinge of the male becomes rather more intense during the breeding season. As to the passionate wooing of the males of *B. macrotis*, Darwin, in his "Descent of Man," states that Dr. Günther had "several times" found an unfortunate female toad dead and smothered from "having been so closely embraced by three or four males."

It would be interesting to know if similar instances have been observed in other species during their breeding season.

P. A. R. BARROX.

November 1918.

PROCEEDINGS OF THE SOCIETY.

5TH ANNUAL GENERAL MEETING.

This was held on the 5th February, 1918, and was attended by 15 members and 5 guests.

The accounts for 1917 were presented and passed. A statement as to the affairs of the Society during the year was made by the President, Mr. W. J. F. Williamson, in which he mentioned that the Society then numbered 79 members, an increase of two on the previous year.

On the proposal of Mr. Brewitt-Taylor, seconded by Mr. Lambert, the officers of the Society for 1917 were re-elected *en bloc*; and on the proposal of Mr. Nunn, seconded by Mr. Lambert, Dr. Smith and Mr. Williamson were again elected Editors of the Journal.

Dr. Smith moved a resolution that "Persons of enemy nationality shall no longer be eligible for membership of the Society." Discussion took place as to whether the resolution would cover present members of enemy nationality of the Society, and an alteration to the resolution was ultimately proposed by Mr. Lambert, making the resolution run as follows:—"That the names of persons of enemy nationality, who are now members of the Society, be struck off the list of members, and that persons of enemy nationality shall no longer be eligible for membership of the Society." This was accepted by Dr. Smith. The motion was opposed by Mr. Cable on the ground that the Society was a Society for scientific research, and as such should welcome contributions from any source irrespective of the nationality of the investigator. The motion, as amended, having been seconded by Mr. Lambert, was put to the vote and carried by 7 votes to 3, a number of those present not voting.

This concluded the business part of the meeting, and a display of specimens by the following members then took place:—by Mr. Williamson, a collection of birds from Nong Kae, S. W. Siam; by Dr. Smith, a large number of sea snakes collected in the Gulf of Siam and upon the coasts of the Malay Peninsula; while Mr. Godfrey gave an interesting display of butterflies.

2ND ORDINARY GENERAL MEETING, 1918.

This was held on the 19th June, 1918, and attended by 19 members and 9 guests.

Dr. Smith exhibited a series of reptiles and batrachians obtained by him on a recent visit to southern Annam, and gave an account of the country visited, illustrated by maps and a number of photographs. Mr. Williamson exhibited some new or noteworthy Siamese birds and birds' eggs, and Mr. Godfrey shewed a collection of spiders and scorpions.

3RD ORDINARY GENERAL MEETING.

This was held on the 4th December, 1918, and attended by 18 members and 9 guests. Mr. Th. H. Lyle exhibited a small collection of

mammals from Koh Lak, including a Siamese hare, golden back squirrels, and tree shrews. Dr. Smith gave an exhibition of the turtles and tortoises of Siam, his collection including almost all the species known to inhabit the country.

Mr. Williamson shewed some of the rarer Bangkok birds. Several other members also contributed to the meeting.

6TH ANNUAL GENERAL MEETING.

This was held on the 26th February, 1919, and was attended by 15 members and 5 guests.

The report and accounts for 1918, showing a present membership of 61, and a balance in hand of Tcs. 706, were presented and adopted. Mr. E. G. Herbert was elected a member of the Committee in place of Mr. G. E. Webb, and Mr. C. L. Groundwater was elected an additional member of the Committee, the remaining members of the Committee, including the officers of the Society and Editors of the Journal, being re-elected *en bloc*. A suggestion was made by Mr. A. J. Irwin that, besides papers being printed in the Journal, they should also be read at meetings of the Society, in order that there might be an opportunity for discussion. This was approved. Dr. Smith remarking that the reading of papers had always been welcomed by the Committee, but that so far very few members had come forward for this purpose.

Upon the conclusion of the business part of the meeting Mr. Godfrey exhibited a collection of butterflies; Dr. Smith shewed specimens of the Siamese crocodile, and compared it with other closely allied species. Mr. Williamson shewed a small collection of birds recently obtained on the coast of Cambodia, including two specimens of the rare Ibis (*Thaumatibis gigantea*).

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Number 4.

ON MAMMALS COLLECTED IN SIAM.

BY C. BODEN KLOSS, F.Z.S.

(With two plates.)

Geographical :—Description of districts visited.

Systematic :—

Presbytis argenteus, nov.

P. cristata koratensis, subsp. nov.

Macaca nemestrina indochinuesis, subsp. nov.

M. irus atriceps, subsp. nov.

Viverricula malaccensis thai, subsp. nov.

Tupaia glis cambodiana, subsp. nov.

T. glis olivacea, subsp. nov.

Tamias maclellandi liantis, subsp. nov.

Menetes berdmorei peninsularis, subsp. nov.

Rattus rajah koratis, subsp. nov.

R. rajah kramis, subsp. nov.

Rattus rattus lanensis, subsp. nov.

R. rattus kramensis, subsp. nov.

R. rattus mesanis, subsp. nov.

R. rattus koratensis, subsp. nov.

Bandicota siamensis, nov.

Capricornis sumatraensis annectens, subsp. nov.

Four squirrels in the present collection were also new :—

Sciurus caniceps inexpectatus, mihi.

S. atrodorsalis pranis, mihi.

S. atrodorsalis tachin, mihi.

S. finlaysoni trotteri, mihi.

They are described in full here, but the names and preliminary diagnoses were first published in the Journal of the Natural History Society of Siam, Vol. II, p. 178 (Dec. 1916).

In 1916 I again spent some local leave in Siam, arriving in Bangkok at the end of September with three Dyak assistants by whose aid 340 specimens of mammals, 420 of birds* and smaller series of reptiles and batrachians were obtained in about thirty-three days of collecting.

At Bangkok I was told I had arrived at about the worst time possible for collecting, since near the end of the year the rains are at their worst, the low-lying parts of the country flooded and the streams and rivers much swollen. This, indeed, I found to be the case: we were everywhere stopped by floods; and instead of collecting at chosen localities we had to work at places where one finally starts for these. We were hardly in forest at any time, and owing to the fact that the state of the country made it almost impossible for us to reach good collecting-ground in the districts I visited, if we were to do any collecting at all in the time available, the results are much smaller than perhaps they would have been in more favourable circumstances. When I left Siam towards the end of November, conditions had begun to improve rapidly: it was the time when our visit should have commenced.

I first spent a night at Lopburi to get hares, and arrived at Korat on September 30th. with the intention of travelling eastward down the Nam Mun towards Ubon, but could not get to the river because the intervening country was flooded to a depth greater than the height of the floor of our bullock-carts. We therefore started south-eastwards towards the mountains, where good forest was reported three or four days away, for I hoped we should travel over rising ground in that direction; but on the second day progress was stopped by wide and deep inundations. As the country through which we passed was covered with scrub, bamboo, or open jungle, in which we saw scarcely any signs of mammals or birds, there was no inducement to make a camp; so we returned immediately to Korat. It was impossible not to admire the way in which the Siamese "kwien" (a bullock-cart built without a scrap of metal of any sort) negotiated the floods and the, in many places, appalling tracks through the

* Vide Ibis, 1918, January, pp. 76-114; April, pp. 189-234.

roadless bush. Outside the wheels of these carts two slightly curved stringers extend from back to front and, where the ruts of the track are too deep for the wheels to touch bottom, the "kwien" is able to proceed for short distances on these runners; they also keep it from tipping over.

From Korat we went back westward about thirty miles to Lat Bua Kao. From the village gently rising forested hills, which I had planned to visit, were visible to the south; but heavy rain, followed by a 25-foot rise of a river between, and the washing away of the only bridge, put an end to hopes in that direction, and we had to be content with working the country to the north of the village. This consisted of scrub and bamboo and a few patches of very poor dense forest which harboured scarcely any vertebrates. After a fortnight, interest in this locality began to diminish and we returned to Bangkok. Wild cattle (probably *Bos banteng*), serow and deer occur near Lat Bua Kao, but none were met with.

Next I went to Sriracha, on the west coast of the Inner Gulf and, hiring a mat-sailed "rua-pet" about 35 feet long, visited the islands to the south (Koh Lan, Koh Kram) as far as Koh Mesan, off Cape Liant, and spent two or three days ashore at the village of Satahip in Shelter Bay, before returning to Bangkok again after ten days' absence. The fauna of the little islands was, of course, very poor, but some interesting races of mammals were obtained.

The next collecting place was the village of Pak Bu, in the rice-fields near the mouth of the Tachin River, or Nam Supan, about twenty miles west of Bangkok; only three or four days were spent in this locality as it was soon exhausted.

The final excursion was a ten days' visit to Koh Lak, situated on the west coast of the Gulf of Siam in about Lat. $11^{\circ}50'$ N.; again floods cut us off from the forest and the hills, and confined us to the open country near the shore.

Thus the collections made largely illustrate the more or less open country of Siam, and provide in some ways an interesting contrast to the results of my former visit, which were obtained in the forested country to the south-east (P.Z.S. 1916, pp. 27—75).

The two places where most specimens were obtained were Lat Bua Kao and Koh Lak. The former is in east Siam about thirty miles west of Korat and just within the eastern foot of the hills which separate the slightly elevated, shallow basin of eastern Siam from the central Siam plain and the Menam river-system. My visit was made in October.

Koh Lak, in the Province of Rajaburi (Ratburi) south-western Siam, is on the east coast of the Malay Peninsula, a little south of the latitude of Mergui. The town is now called Prachuap Kirikan; but the other name is so much better known that I have continued to employ it, though it really applied to some small limestone islets lying a few hundred yards from the shore. "Koh" means island, but in this instance all my collections were obtained on the mainland; in all other cases where the word occurs in this paper the specimens recorded are insular. I stayed at Koh Lak in November.

The divisions of Siam which I have used (Central, Eastern, etc.) are as defined in P.Z.S. 1916, p. 64, and Journ. N. H. Soc. Siam, I, p. 250 and map, except that—following Dr. Malcolm Smith, Journ. N. H. S. Siam, II, p. 49—I have now divided the longer continuous strip there called Western and Peninsular Siam into three areas, and call the middle portion South-western Siam. The new division lies between the reduced areas of the other two, and stretches from the Petchaburi River to the Isthmus of Kra—roughly speaking, between latitudes 13° and 10°30'N. Western and south-western Siam are therefore conterminous with the Burmese province of Tenasserim; while Peninsular Siam is restricted to the northern part of the Malay Peninsula below the Isthmus of Kra, and has the Malay States to the south of it.

I am indebted to Mr. Oldfield Thomas for the determination of the *Crocidura* and the four species of *Microchiroptera* obtained.

There are several printer's errors in the account of the Mammals obtained on my earlier visit (Proceedings of the Zoological Society, 1916, pp. 27-75) which I take this opportunity to correct.

Page	28	line	31.	<i>For</i>	Klun	<i>read</i>	Klum.
"	29	"	"	"	Koh Si	"	Koh Si Chang.
"	32	"	35	"	paler	"	darker.
"	39	"	8	<i>between</i>	on	<i>and</i>	islands insert large
"	"	"	"	"	<i>for</i>	animals	<i>read</i> islands.
"	"	"	9	<i>delete</i>	forms		
"	"	"	"	<i>for</i>	those	<i>read</i>	the homes
"	40	"	23	"	Siam	"	Saigon.
"	57	"	34	"	Bonhote	"	(Blyth).
"	59	"	38	"	10.1	"	16.1
"	66	"	4	"	3660	"	2135.
"	70	"	9	"	Mennaw	"	Menao.
"	71	"	10	"	"	"	"

Pages 66-75. Measurements of rodents (squirrels and rats):—
for Condyllo-basal *read* Condyllo-basilar
 " Palatal " Palatilar.
 (as in the present paper).

Regarding the rats of which measurements are given on p. 59 in the Proceedings; of the specimens previously determined by Thomas as *berdmorei*, that from Thagata, Tenasserim, has since become the type of *Rattus berdmorei mullulus* Thomas, while the Manipur, and probably the Bhamo, specimens are now *Rattus manipulus* Thomas (Journ. Bombay Nat. Hist. Soc. XXIV, pp. 412-414).

Kuala Lumpur, Federated Malay States,
 February 1918.

PRIMATES.

1. *Presbytis obscura smithi*.

Presbytis obscura smithi Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 5 (1916).

Presbytis obscura Gairdner, Journ. Nat. Hist. Soc. Siam, I, p. 116 (1914);

2 ♀ ad. Koh Lak.

The pale fore-arms and tail and silvery white hind-limbs, in sharp contrast with the body and feet, render this race of *obscura* by

far the most striking of the forms into which the species has been divided.

The darkest and most concolorous animals occur about the latitudes of Penang and Kedah, and the races become more variegated as they recede from that locality both to the north and southwards; but animals from the latter region do not attain the contrasting colours which are so marked in the present subspecies. The description of the typical form applies perfectly to examples from the extreme south, and Cantor's statement regarding its habitat, "district adjacent to Singapore, Malayan Peninsula" (Journ. Asiat. Soc. Bengal, xv, 1846, p. 174) may be taken as indicating the typical locality.

In colour these two females agree perfectly with the male which is the type of the subspecies,¹ except that in one of them the median area of the upper back is paler: their skulls are smaller and have considerably smaller rostrums.

Mr. K. G. Gairdner has found *P. obscura* (identified *in litt.* as the present race) generally distributed in the province of Petchaburi, but states that it is not found in Siam north of Lat. 13° 20'.

Gyldenstolpe (Kungl. Sv. Vet. Akad. Handl, 57, No. 2 p. 5. 1916) records *P. o. flavicauda* (Elliot) from Koh Lak and *P. o. halonifer* (Cantor) from Koh Lak Paa (Koh Lak forest), which is within a day's walk of the former place. Apart from the improbability of finding two such geographical races in the same district, *halonifer* is the name given to a local form from Penang Id., and that identification, at least, is not likely to be correct. The present females and the type have been compared with series of both those forms and all three races differ considerably.

Méasurements:—See table *postea*.

2. *Presbytis argenteus*, nov.

Presbytis phayrei, Gairdner, Journ. Nat. Hist. Soc. Siam, 1, p. 252 (1915).

Types. Adult male and female (skins and skulls), Nos. 2144

¹ By an error in the original description the type was stated to be a female.

and 2127/C.B.K. Collected at Lat Bua Kao, East Siam on 8th and 11th October, 1916.

Characters. A grey leaf-monkey with dark hands and feet; pelage not grizzled. A whorl of hair on the occiput and an erect crest, forming either an upstanding tuft or a median ridge.

Colour. Male:—A row of stiff black hairs above the eyes. Crown and temples somewhat fuscous. Whiskers, shoulders and upper parts nearly neutral-grey slightly washed with wood-brown giving a general colour-effect of silvered mouse-grey. Rump, lower limbs and base of tail silvery, rest of tail deep mouse-grey slightly washed with wood-brown and silvered; front of thighs deep mouse-grey; feet brownish-black. Throat, chest and forelimbs deep mouse-grey, the latter gradually darkening over the forearms to brownish black on the hands. Abdomen and inner side of upper arms slightly paler than chest, the inner sides of the forearms darker but less so than on their outer aspect.

Type female as in the male, but the whiskers and upper surface—especially the occiput, neck and shoulders—paler, more silvery and with the wood-brown wash very distinct on the median line of the upper back, while the undersurface is also paler, being of a yellowish silvery tone. The feet are slightly grizzled.

A slightly younger female (2128), and a juvenile female (2129), are rather deeper mouse-grey than the male, and more washed above with wood-brown than either of the types; in the older of the two the thighs are also washed with wood-brown and the distal half of the tail is tinged beneath with ferruginous. A yet more juvenile male (2130) is darker still, being almost deep quaker-drab and scarcely silvered at all, except on the chest, which is silvery white.

These animals might alternatively perhaps be described as quaker-drab, but their colour is difficult to express as it varies with the incidence of light, and the above descriptions have been drawn up with the specimens placed near a window, heads pointing to the left.

Measurements. External measurements of the types taken in

the flesh:—head and body, 575, 498; tail 810, 775; hind-foot, s.u. 178, 159; ear, 37, 34.

Skulls:—greatest length, 103, 95; basal length, 75.5, 70; zygomatic breadth, 78, 71.4; upper tooth-row excluding incisors (alveoli), 33.5, 32. For other measurements see table *postea*.

Specimens examined. Two adult males, three adult females and two juveniles, all from the type locality.

Remarks. This leaf-monkey also occurs in Western Siam from Sisawat (*vide* Gairdner *loc. cit.*) to Raheng, from which neighbourhood I have received a skin collected by Messrs. Elwes and Yates. It is probably Tickell's *S. phayrei* from "east of Moulmein," of which a description and figure are given by Blanford (Faun. Brit. Ind. Mamm., p. 41, fig. 10).

Presbytis phayrei (Blyth) of Arakan (of which I have examined the type series in the Indian Museum) is a very different animal, being white or yellowish white below and brown elsewhere, paler and silvery across the shoulders and darker or blackish on the forehead and the extremities of the limbs. Its crest is an erect compressed ridge curling slightly backwards, but the hair of the head shows no sign of radiating.

3. *Presbytis cristata koratensis*, subsp. nov.

Type. Adult female (skin and skull) No. 2136/C. B. K. Collected at Lat Bua Kao, east Siam on October, 1916.

Characters. A silvered greyish leaf-monkey, much lighter in colour than *P. germaini* (M-Edw.) and without the white nuchal band and bluish tinge of *P. margarita* (Elliot).¹

No crest nor whorl of hair on the head of the type. A fringe of stiff black hairs immediately above the eyes. Anterior hairs of crown curling forwards and downwards; whiskers first directed backwards, then forwards and downwards; the ears completely hidden by them and by the long hairs of the sides of the neck. Hair of crown and occiput growing mostly backwards and

¹ Ann. & Mag. Nat. Hist. (8) IV, p. 271 (1909).

Pygathrix margarita, Elliot, Review of the Primates, III, p. 81, pl. 2 (1923).

downwards, the latter slightly lengthened but not forming a pad or cap.

Colour. Sides of face, chin and whiskers silvery, the latter slightly tinged with buff. Upper parts deep fuscous-grey (the roots of the hairs deep mouse-grey) much grizzled or frosted by the silvery tips of the hairs, the median line of shoulders and back darkest. Hair of shoulders and sides with neutral grey bases and silvery tips, that on the sides being longer and much paler.

Outer sides of forelimbs less frosted on the upper arm than the shoulders, and gradually darkening over the forearm to clear black on the hands. Hind-limbs like the sides on their outer aspect, the front of the thigh darker; the lower leg very silvery; feet sharply contrasting, black very slightly grizzled.

Throat, lower parts of body and inner sides of limbs buffy-silvery to pale neutral grey.

Tail black throughout and slightly grizzled, the upper surface darkest (when entirely unworn many more of the hairs probably have silvery tips), base of the undersurface buffy-silvery.

There is the usual sex-mark of the female:—a large white crescentic skin patch extending from below the callosities down the inner side of either thigh.

Skull and teeth. Agree with those of *P. germaini* except that the ascending ramus of the mandible is narrower.

Measurements. External measurements taken in the flesh:—head and body 495; tail, 795; hind-foot, s. u., 152; ear, 37. Skull:—greatest length, 95; basal length, 68; upper tooth row excluding incisors (alveoli), 29; zygomatic breadth, 70.

Specimens examined. One, the type.

Remarks. Our knowledge of the silvered leaf-monkeys is not complete, and the relationships of the various forms is still somewhat obscure, but the present animal is related to *P. germaini* which is really only a local form of *P. cristata* (Raffles).

I have been able to examine a series of these monkeys from Indo-China and Malaysia: they are *germaini* from S. E. Siam;

*mandibularis** from Koh Chang Id., S. E. Siam; *cristata* from Sumatara; *pullata*† from Bintang Id., Rhio Archipelago, *ultima*‡ from Borneo, and finally animals from the Federated Malay States. The latter seem to have a similar skull and exactly the same colour as *ultima* from which, on the series available, they can only be distinguished by the form of crest: this in Bornean animals grows backwards, coming to a point on the occiput, while in Malayan examples it is erect, forming a distinct tuft or ridge. The difference seems to be of no importance as, of two specimens of *mandibularis*, one has an upstanding tuft and the other has the hair on occiput and nape as in *koratensis* but rather more lengthened. The range of the Malayan animal appears to be very limited, as it is only known from the stretch of coast between Penang and Malacca on the west side of the Peninsula.

P. pullata was described as being darker than *cristata* and with smaller teeth. I have little doubt, however, that comparison was made with Malayan animals, which were sent home with it, and not with typical Sumatran individuals; for on comparing examples of it with a specimen of the latter, the only difference I can detect is that the general colour-effect of the dorsal pelage is brownish black rather than greyish black as in *cristata*. The following Key illustrates the differences shown by all these races as far as colour is concerned; the species becomes paler as it goes northward:—

A. Blackish, only slightly silvery, base of fur greyish-black.

a. whiskers blackish, only slightly tipped with silvery; throat blackish.

a¹ darker colouring greyish-black *P. c. cristata*.

b¹ darker colouring brownish-black *P. c. pullata*.

b. whiskers pale, nearly silvery throughout; throat pale grey.

* Kloss, P. Z. S., 1916, p. 32.

† Thomas and Wroughton, Ann. & Mag. Nat. Hist. (8) III, p. 439 (1909).

‡ Elliot, Proc. U. S. Nat. Mus., 38, p. 351 (1910).

- a*¹ thighs very silvery *P. c. germaini*.
*b*¹ thighs less silvery, blackish *P. c. mandibularis*.

B. Very silvery, base of fur neutral-grey;
 whiskers and throat silvery *P. c. koratensis*.

C. Paler than A, darker than B: whiskers intermediate between Aa and Ab: throat grizzled. *P. c. ultima*.

(Borneo and Malay States).

4. ***Macaca nemestrina indochinensis***, subsp. nov.

Macaca anlamensis, Kloss, P. Z. S. 1916, p. 30; id. Journ. N. H. Soc. Siam, II, p. 2 (1916).

Type. Adult male (skin and skull) No. 2148/C.B.K. Collected at Lat Bua Kao, East Siam on 12th October 1916.

Characters. Like *Macaca nemestrina adusta* Miller, of South Tenasserim* but of duller colour, lacking the russet hue of the latter on back and shoulders, facial ruff less annulated, buttocks and sub-caudal region paler; but with a more distinct dark line down the back.

Colour. A whorl of hairs on the vertex. A few stiff black hairs above the eyes; crown blackish brown sharply margined in front and narrowing to a point on the forehead, but fading on the occiput into the colour of the nape: sides of face, temples and whiskers pale greyish buff; anterior parts of the ear-ruffs tipped with blackish brown. Nape, shoulders, outer sides of upper arms and anterior half of back mummy-brown annulated with ochraceous; posterior half of back duller and darker, mummy-brown annulated with buffy; from behind the shoulders an indefinite median line of clove-brown continued to the tail which is blackish brown on the upper surface, entirely so at the tip and pale isabelline below elsewhere. Forearms markedly annulated buff and fuscous; hindlimbs, which are browner, like the rump but the grizzling very faint on the shins. Buttocks and an indistinct tuft on either side of the tail-root buffy white. Fore-digits clove-brown and hindfeet largely so. Ears white hair above and behind them, throat, chest and inner sides of arms greyish white. Abdomen pale brownish grey.

* Proc. U. S. Nat. Mus. xxix, p. 559, pls. xiii-xvii, (1906).

This male differs from the females whose appearance I have recorded under *M. andamanensis* (l. c. s.) in having the top of the head, median line of back and the extremities darker; limbs greyer throat chest and buttocks whiter; abdomen coarsely but indistinctly annulated; and size much greater.

It is fully adult with the teeth begining to show signs of wear and is a trifle larger than the type of *M. n. adusta* – the hind foot notably so; it is also, judging by the approximation of the muscular ridges on the parietals (18 mm.) a little older, but the form of the skull and its measurements and characters are in markedly close agreement. In connection with it I have examined a series of pig-tailed macaques (males) from the Malay Peninsula; all those from the Malay States, i.e., the South, are either *Macaca nemestrina* (typical locality, Sumatra) or a slightly modified form; and are characterised by long muzzles, black crowns, and backs so blackened (though the spread of the latter colour is variable) that the black tail forms no contrast. Of two males from Trang, Peninsular Siam, however, one is a typical southern animal in every respect; the other approaches *adusta* in colour as regards the reduction of the black element, though without the bright rufous suffusion; but its muzzle, though shorter than in *nemestrina*, is not modified to the same extent as in Tenasserim animals. Trang may therefore be regarded as the locality where intermediates between the two forms occur.

I have also been able to compare my specimen with a male example of *M. andamanensis* Bartlett. The latter is the type of *M. leonina* Blyth, and was at one time mounted and exhibited, and owing to exposure its colour is now much deteriorated: it is, however, even more annulated than *indochinensis*, and the median line of the back was apparently not darkened or, if so, yet so slightly that annulations are clearly visible¹; otherwise the general ex-

1. Anderson, however, (Zoological Researches in Yunnan, p. 52), says that "*leoninus*" has a dark median line on the lower half of the back and that above the tail there are no annulations: but these features are not mentioned in his descriptions of Blyth's specimen (Cat. Mammals Indian Mus., I, p 71), and the later account in the "Researches" is perhaps drawn up from an Irawadi specimen showing gradation towards *M. adusta*.

ternal appearance of both seems very similar. There are the same distinct pale tufts on either side the root of the tail, though the tuft at the end is reddish in *andamanensis*; the hairs of the upper back and shoulders are no longer than in *nemestrina*, *adusta* and *indochinensis*, and the so-called "horseshoe-shaped crest" is similar—this latter appears to have been much exaggerated in descriptions and illustrations. The limbs are apparently shorter but proportionately stouter, and the skull (according to Anderson, for that of the present example is now missing) had the face more vertical and the muzzle much shorter (Zool. Res., p. 53, figs 1 and 2). The main differential characters therefore seem to be:—

1. Muzzle elongated; back much blackened; annulations coarser and less distinct, and the area covered by them not forming such a large proportion of the pelage; limbs longer....*nemestrina*.

2. Muzzle modified and tapering; back only slightly blackened on the median line; annulations finer and markedly present over a large area; limbs as in *nemestrina* (a) shoulders bright russet....*adusta*. (b) shoulders only tinged with dull russet....*indochinensis*.

3. Muzzle much reduced and shortened, resulting in a much more vertical face; median line of back scarcely blackened: pelage much annulated nearly everywhere; limbs apparently stouter and shorter....*andamanensis*.

In spite of the cranial and other differences it is indubitable that all are only subspecies of *nemestrina*.

In previous papers on Siamese mammals I recorded as *M. andamanensis* two females which evidently belong to the present form, one of which came from a locality but a few miles distant from Lat Bua Kao. I did this, however, with some hesitation because of the difficulty in identifying solitary females of these monkeys of which no good account existed, and it was solely because descriptions and measurements (Zool. Res., pp. 53, 55) regarded by Anderson as those of *andamanensis* so closely applied, that my specimens were placed under that name, *adusta* being rejected in faith of Elliot's statement that the females were without

conspicuous annulations on the upper parts and presented a striking contrast to the males (Review of the Primates II, p. 207). As the second of these females came from the extreme south-east of Siam, the range of *indochinensis* may be taken as covering the southern half of that country east of the Chao Phya river.

The teeth of this race are somewhat variable; for instance small extra tubercles are developed on both sides of the upper molars of the female principally at the ends of the transverse channel between the main cusps, but they are only present on the inner sides of m^2 and m^3 in the male. The latter has, however, a large cusp forming a marked heel in both posterior molars, especially large in the lower, and this is entirely lacking in the female.

Dimensions of the adult male:—Collector's external measurements taken in the flesh: head and body, 525 (555)¹; tail, 250 (230); hind-foot, s.u., 179 (163). Skull:—Greatest length, 138 (136); condylo-basal length 108.5 (—); basal length, 97.5 (—); palatal length, 64 (—); maxillary tooth-row including canine, alveoli, 46.5 (46.8); diameter of upper canine at alveolus 10 (10); diameter of last upper molar, 9.7×8.2^2 (9.6×9.0); front of orbit to gnathion, 52.8 (53.8); front of orbit to posterior point of skull, 94³ (89.7); greatest breadth of muzzle above the canines, 31 (—); greatest breadth of rostrum above m^3 , 43 (—); zygomatic breadth 95.2 (94); breadth of braincase above roots of zygomata, 67.2 (64.4); depth of braincase between extremity of frontal and lower edge of condyle, 58.3 (59); length of mandible, 98 (100); mandibular tooth row including canine, alveoli, 51 (53).

5. *Macaca irus*.

Macacus irus, F. Cuv. Mem. Mus. Hist. Nat. Paris, IV, p. 120, (1818).

Macaca irus, Kloss, P.Z.S. 1916, p. 31.

1♂ juv., 1♀ juv. Lat Bua Kao.

Two, dull-coloured animals with radiating crests.

¹ Measurements in parentheses those of the type of *M. n. adusta* from Champang, S. Tenasserim, U. S. N. M. No. 124023.

² Crowns.

³ to posterior point of braincase.

The specific name for the crab-eating monkey of S. E. Asia and the Malay Islands is *Macaca irus* Cuvier (syn. *fascicularis* Raffles, vide Cabrera, Ann. and Mag. Nat. Hist. (8) VI, p. 620). I have not seen sufficient material from Sumatra (typical locality) to show whether the animals of the mainland are subspecifically distinct; a fairly large collection of the latter, however, may be divided roughly as follows:—

1. Of twenty-five examples from the Malay Peninsula north of Lat 9°, Tenasserim, East and South-east Siam, and small islands off the coasts, all are dull-coloured animals having no tone of bright ochraceous in their upper parts.

2. Of forty-five specimens from the Peninsula south of Lat. 8° and neighbouring small islands, the majority (especially regarding the islands) have a decided ochraceous tone on the head and back, sometimes so intense as to be ferruginous: but there are a few which are indistinguishable from northern examples

Such a distinction, however, seems to be of no value; as Blanford states that both dark coloured and golden rufous animals are found in Burma; it is from one of the latter that *M. aureus* Is. Geoffr., is described.

Elliot has given names to a number of macaques recently: *Pithecus capitalis* seems to have been based merely on a very large specimen from Trang, Peninsular Siam, and a topotype can be exactly matched by an example from Singapore, to animals from which island the same author has given the name *Pithecus dollmanni*. *Pithecus validus* "is stated to have come from Cochin China," and *P. ritii* is attached to a specimen from Domel Id, Mergui Archipelago.

6. *Macaca irus atriceps*, subsp. nov.

Type. Adult male (skin and skull) No. 2283/C.B.K. Collected on Koh Kram Id. near Cape Liant, S. E. Siam on 30th October 1916.

Characters. A very distinct race of *M. irus* Cuv., with much black in the pelage, a black area on the crown and the basal half of the tail blackened above. A slight occipital crest. Bare skin of

face and buttocks brightly coloured.

Colour. Upper parts of neck and body, shoulders, outer sides of forelimbs and outer parts of upper thighs a grizzle of black and buff, the annulations becoming finer and the buff paler on the thighs and forelimbs; the nape darkest. Feet and lower part of thighs externally mouse-grey, darkest on the feet, the thighs very faintly annulated with pale buffy. Hairs on all digits pale smoke-grey; the hands dark fuscous, scarcely spotted. Lips and ears, sides of neck and body, entire underparts, inner sides of limbs, buttocks and lower side of tail smoke-grey. Upper side of tail brownish black basally, becoming gradually paler towards the tip where it is fuscous. Crown with a black elliptical area, about 50×40 mm., slightly grizzled in the centre. Temples and cheeks buffy grey beset with black hairs. Base of fur on neck and back blackish-brown.

Bare skin of face red-brown, eyelids bluish-pink, abdomen bluish-white, skin about anus plumbeous-blue, scrotum brownish; callosities pale bluish, or yellowish-fleshy.

Skull and teeth. This race is distinguished by the large rostrum and mandible and by the great size of the teeth. In males the tooth-rows are only slightly arched and the greatest breadth across them is at m^2 ; in females they are extremely arched and adjacent posteriorly, and the greatest breadth is at m .¹ The type and a second male (2284) have marked sagittal crests.

Specimens examined. Four adults and one juvenile male; two adults, one sub-adult and one juvenile female.

Remarks. This macaque appears to have some resemblance to *Macaca validus* (Elliot)* stated to have come from Cochin-China which also has the crown and upper part of tail black at base, but otherwise its colour seems very different, *validus* being a brighter and browner animal with olive tones on the limbs. The skulls seem to be much alike, but the teeth of *atriceps* are larger, though the mandible is much shorter (if the measurements given by Elliot are correct; often they are not).

* *Pithecius validus* Elliot, Ann. & Mag. Nat. Hist. (8) IV p. 252 (1909).

Measurements of *Macaca irus atriceps*.

No.	...	...	2283 Type.	2284	2285	2282	2288	2286	2287
Sex.	...	...	♂ad.	♂ad.	♂ad.	♂ad.	♀ad.	♀ad.	♀sub ad.
Head and body, measured in flesh	...	...	465	425	460	445	435	410	415
Tail	..	...	550	545	540	515	475	480	475
Hind foot, s.u.	..	...	137	130	132	129	117	115	112
Ear	..	...	46	45	49	49	43	43	43
Skull and teeth:—									
Greatest length	...	...	120	117	116.5	113.5	106	103	99
Basal length	...	...	87	84	85	82	71	71	68.2
Palatal length	...	...	53	—	54	52.5	—	43.5	41
Zygomatic breadth	...	...	80.2	—	77	82	—	69.5	68
Upper tooth row excluding incisors	...	...	42	39.5	42	40.2	36.1	36.1	35
Upper molar series only	...	...	33.1	32.0	34.3	32.7	32	30.6	31
$m^2 - m^2$ externally	...	...	37.1	36.2	37.0	35.7	—	34.4	33.8
Lower tooth row excluding incisors	...	...	46.5	44.6	48.4	44	40.6	—	39
Lower molar series only	...	...	39.8	38	41.1	38	37	—	34
Length of mandible	...	...	86.2	86	88.2	85.3	75	73.3	71

Table of measurements (in millimetres). Measurements of hind feet are always exclusive of claws.

Species and Locality	Sex	Total length	Tail	Hind-foot s. u.	SKULL.				No.	Remarks	
					Greatest length	Basal length	Zygomatic breadth	Upper molar row (alveoli)			
<i>Presbytis obscura smithi.</i>											
Koh Lak, S. W. Siam ...	♀	1230	700	162	90	64	69	24	2408	Adult.	
" " " " " "	♀	1184	700	164	94	67	69.6	25	2435	"	
Klong Bang Lai, Patiyu, S. W. Siam	♂	1345	783	167	100	73	78	27.5	2028	" Type.	
<i>Presbytis argenteus</i>											
Lat Bua Kao, E. Siam	♂	1436	878	172	113	79	83.5	27.3	2461	Pronounced sagittal crest.	
" " " " " "	♂	1385	810	178	103	75.5	78	26.5	2144	Adult Co-type.	
" " " " " "	♀	1273	775	159	95	70	71.4	26.5	2127	" Co-type	
" " " " " "	♀	1260	750	150	98	68	72	27.2	2128	"	
" " " " " "	♀	1272	781	157	96	69	70	32.2*	2462	"	
<i>Presbytis corbata koratensis</i> .*											
Lat Bua Kao, E. Siam	♀	1285	795	152	95	67.6	70	24	2136	" Type.	

* including claw.*

One male (2285) is rather more warmly coloured than the rest of the series, the yellow in the upper pelage being ochraceous-buff and the speckling of the fore-limbs correspondingly brighter, but otherwise it agrees.

I did not obtain any monkeys on the coast adjacent to Koh Kram so it is impossible to say yet whether this is an insular race or has a greater range: animals from Korat and Chantabun do not resemble it. It is a striking looking macaque on account of its black cap and bright skin colours, the face being such a red-brown that the collector who first saw it reported that *M. rufescens*, with which he was acquainted, was in the neighbourhood. The skin colours of the females differ slightly from those of the males, in that the teats are bluish-pink, the skin surrounding both anus and callosities is plum-coloured and the callosities are dull pale yellow and bluish mixed.

The slight up-standing occipital crest is sometimes rather irregular and twisted: it is generally produced by the radiation of the hair from two closely adjacent points.

CARNIVORA.

7. *Felis bengalensis*.

Felis bengalensis, Kerr, Animal Kingdom, p. 151 (1792); Flower, P. Z. S. 1900, p. 325; Gyldenstolpe, Arkiv. för Zoologi, 8, No. 23, p. 25 (1914); Kloss, Journ. N. H. Soc. Siam, III, p. 51 (1918).

Felis tenasserimensis, Gray, P. Z. S., 1867, p. 400.

1 ♀ adult. Koh Lak.

A very dull-coloured specimen; general colour above dull, slightly greyish buff, rather brighter on limbs and sides, the head, neck and median line of back tinged with ochraceous-tawny. The black spots on the sides are generally situated at the posterior end of indistinct ochraceous-tawny patches which sometimes connect two or three spots together; spots on the limbs rounder and very small at the extremities; two large elongate ochraceous-tawny areas on the shoulders nearly surrounded by black. Upper surface of tail like the back with dark brown spots, a few narrow bands at the tip. Markings on head, neck and ears normal.

Below white with bold blackish markings; underside of tail slightly buffy, markings obsolete. Lower sides of forefeet pale buffy grey, of hindfeet dark brown; inner sides of hindfeet whitish.

Measurements:—head and body, 500; tail, 290; hindfoot 111, ear, 45. Skull:—greatest length, 88; greatest breadth, 58; upper sectorial, length 10, breadth 4.8; length of lower molar row (alveoli) 20.

8. *Viverricula malaccensis thai*, subsp. nov.

Type. Aged female (skin and skull) No. 2449/C.B.K. Collected at Prapatom, Central Siam on 20th November, 1916.

Diagnosis. Size and markings as in *V. m. malaccensis* (Gm.), with seven dark rings on the tail, but the buffy ground colour slightly paler and duller and with more numerous black-tipped hairs; tail more nearly white.

Skull and teeth as in *malaccensis* with long and deep bullae which, however, only converge slightly so that the anterior part of the basioccipital is but little narrowed, while the ridges in front of the bullae are small; in this respect resembling the smaller *V. m. rasse* (Horsf.) of Java though the bullae are not flattened.

Specimens examined:—Two females both from the type locality.

Remarks. Mr. Bonhote in his revision of the genus *Viverricula** states that *malaccensis* is very variable in colour and markings, but the remark is of a general nature and applies to animals found throughout India and the Malay Peninsula. I have compared the Siamese examples with topotypes from the Malay States and the colour differences noted, though slight, seem constant. *V. m. thai*† is most nearly allied to *V. m. malaccensis* from which it differs in only two other respects—the slight convergence of the bullae, which is a feature of *V. m. rasse*, and rather narrower skull.

***Hyaena striata*?**

Reports that I have received seem to indicate the presence of a hyaena in Siam, and if it really occurs its existence there is

* Ann. & Mag. Nat. Hist. (7) 1, pp. 119-122 (1898).

† Muang thai=Land of the free=Siam.

Measurements of *Viverricula malaccensis*:—

Number					<i>V. malaccensis thaj</i>		<i>V. malaccensis malaccensis</i>	
					2448/ CBK	2449/ CBK	107/14/ FMS	109/14/ FMS
					Type			
Sex	...	...	...	...	♀ ad.	♀ aged.	♀ ad.	♂ ad.
Head and body	...	...	...	...	530	544	553	520
Tail	...	...	...	...	355	335	331	345
Hindfoot, s. u.	...	...	...	...	97	92	94	93
<i>Skull.</i>								
Greatest length	...	...	...	...	98.5	96.5	97	96
Condyllo-basal length	...	...	...	...	94	94	96.1	94.4
Basal length	...	...	...	...	91	90	92	89
Palatal length	...	...	...	...	46	47.5	48	46
Upper toothrow, excluding incisors (alveoli)					35	35.4	35.2	35
Last three upper cheek teeth (alveoli)					14	13.2	14	13.1
Greatest diameter of upper sectorial					10.1	9.1	9.9	9.9
Breadth of palate between inner roots of sectorials					14.1	13.2	13.5	14
Least interorbital breadth					12.9	12.2	13.9	14
Breadth across postorbital processes					19.7	20.6	21.1	22
Zygomatic breadth	...	...	...	...	46	46	47	47.4
Cranial breadth	...	...	...	...	31	30	31.8	31.3
Greatest breadth across bullae					31	30.6	30	30.2
Greatest length across bullae					22	22.5	22.8	21.8
Least breadth between bullae anteriorly					8.7	8.3	7.3	6.9
Least breadth between bullae at condyloid foramina					13	12	13	12.3

most interesting, as it is at present unknown east of the Bay of Bengal. Mr. A. J. Irwin, Adviser to the Royal Siamese Survey Department, told me that he has twice seen large blunt-headed, dark and light grey beasts (one of which had crushed the limb-bones of a dead ox); once at Bungplasoï, about 30 miles east of the Chao Phya river mouth, and again somewhat north of Kanburi; while Mr. J. J. McBeth of Bangkok has also given me a similar description of an animal met by him. The characters noted fit *H. striata* very well, and no other dog-like animal in Siam has the bone-breaking powers mentioned by Mr. Irwin. But an earlier record of the occurrence of a hyaena in still more eastern longitudes is that by Mr. J. McCarthy in "Surveying and Exploration in Siam." Writing of his journey from Wien Chan (Vien Thian) to Chieng Kwang (Xieng Khouang) now in French Laos, he says (p. 40) "One morning I saw a striped hyaena standing under a tree. The camp pariah dog gave chase but I called him back. On nearing the jungle the wily hyaena stopped and turned round, seeming very much disappointed and looking longingly after the dog. As usual, my gun was nowhere".

9. *Canis aureus*, subsp.

Thos aureus cruesmanni, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 23 (1917).

A juvenile example from Wang Pong, Pran, S. W. Siam, is so young (greatest length of skull 127 mm.), that it conveys no correct idea of the adult animal. Neither Gyldenstolpe nor I succeeded in obtaining the jackal at Koh Lak where it is well known, so the present example is the most southerly on record outside India and Ceylon.*

Canis aureus cruesmanni (Matschie, S. B. Ges. Naturf. Freunde Berlin, 1900, p. 144) is based on some young animals living in the Berlin Zoo which were captured at Nong Bua about 30 miles west of Korat. Matschie's description is that of the animals when about a year old. When about half that age or less they

*[Jackals are said to be common near the sea shore not far north of Chumpon. Eds.]

were pale brown on head and legs the bodies were speckled, tails blackish and lips whitish. Broadly speaking the present specimen agrees; the hinder parts are somewhat grizzled and there is a broad blackish line along the back from the shoulders.

The jackal is well known to the Siamese who call it *ma ching chawk*, i.e., dog which makes a noise like a gecko (*ching-chawk*).

10. *Cyon javanicus*.

Canis javanicus, Desm., p. 198 (1820).

Canis familiaris var *sumatrensis*, Hardwicke, Trans. Linn. Soc. XIII, p. 231, pl. XXIII (1822).

Canis rutilans, S. Mull. in Temminck's Verhandeligen, Zool. Zoogd., pp. 27, 51 (1839-44).

Cuon rutilans, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57. No. 2 p. 23 (1917).

Whilst walking in some long grass along the edge of a patch of jungle at Lat Bua Kao, I almost stepped on a wild dog. It darted into the bush instantly but I was able to note the rich ferruginous colour and bushy black tail. Siamese name, *ma pa*.

INSECTIVORA.

11. *Crocidura fuliginosa*.

Sorex fuliginosus, Blyth Journ. Asiat. Soc. Bengal XXIV, p. 362 (1855).

1 ♀ in spirit, Lat Bua Kao.

External measurements: head and body, 117; tail, 43; hind foot, 13.

12. *Tupaia glis belangeri*.

Cl [adobates] belangeri, Wagner, Schreb. Säugeth. Supp. II, p. 42, (1841).

Tupaia pygmaea, Lesson, Nouv. Tabl. Reg. Anim. Mamm., p. 93 (1842).

Tupaia glis belangeri, Kloss Journ. N. H. Siam. III, p. 53 (1919).

6 ♂ 7 ♀ ad. and subad. Koh Lak, S. W. Siam.

1 ♀ subad. Pran River mouth, S. W. Siam.

1 ♂ ad. Hua Hin, Pran, S. W. Siam.

1 ♀ ad., 1 ♀ imm. Satahip, S. E. Siam.

4 ♂ ad., 1 ♀ imm., 1 ♂ ad. Lat Bua Kao, E. Siam.

The discovery in the extreme south of Tenasserim of *T. clarissa* Thomas, (Journ. Bombay N. H. Soc. XXV, 1917, p. 200) which was described as a full species, seems to me to supply evidence of complete gradation between the southern brightly-coloured, long-snouted tupaia with 4 mammae ("*ferruginea*" forms), and the northern dull, short-snouted animals with 6 mammae ("*belangeri*" forms) and to make it now necessary to regard all of them as merely subspecies of one species, *T. glis* (Diard) of Penang, rather than to establish the specific distinctness of other animals than *glis* (cf. antea p. 54). The animals listed above must, I think, be regarded as examples of *belangeri*. I have seen no skins of topotypes, but two skulls of adults from Lower Pegu and South Arakan have rostral lengths (tip of premaxillaries to lachrymal notch) of 19.8 and 19 mm., and in this respect the present series, in which the rostrums so measured range between 18 and 20 mm., agrees with them.

All are dull-coloured animals with a well-marked neck-stripe and, though two or three are darker throughout than the rest, in none of them is the rump washed with ochraceous; or if it is the colour is hardly appreciable, and generally occurs on the shoulders also. Mammæ 3 — 3 = 6:

They cannot be referred to *chinensis* Anderson, from Yunnan, near Bhamo, also a dull-coloured animal, as in it the neck-stripe is practically obsolete,¹ while from an intermediate locality (Nan, North Siam) Thomas has described a form, *laotum*² and also on either side of *chinensis* has defined other races, *siccata*² from the Lower Chindwin, Burma, and *yunnalis*² from Mongtze, S. E. Yunnan, all being quite different in colour. My specimens from S. W. Siam (which do not seem to differ from the others) doubtless represent *tenasser* recently described by Thomas from the Great Tenasserim River in the same latitudes,³ but that name seems antedated by

¹ The north-eastern tupaia (*chinensis*, *yunnalis*, *modesta*, *concolor*, etc.) all seem to differ from the western and southern races in the absence, or great reduction, of the neck stripe.

² Ann. & Mag. Nat. Hist. (8) X111 p. 243-4 (1914).

³ Journ. Bombay Nat. Hist. Soc. XXV, p. 201 (Sept. 1917).

siamensis Gyldenstolpe,¹ based on a single semi-adult specimen from Koh Lak. It is stated to be most nearly related to *T. minor malaccana* Anderson, while the skull resembles that of *T. javanica* Horsf., but is narrower. The former is unknown north of the Malay States, and *javanica* has never yet been correctly recorded from continental Asia; and though it is possible, as in the case with several other species, that it occurs in Java and again in Indo-China but is absent from the greater part of the Malay Peninsula (c.f. *Bandicota*, *Helictis*, etc.), yet, since a good deal of thorough collecting has been done in the area now being dealt with, it is curious that no animal of the kind indicated has been obtained previously — if it exists. Tupaias are quite conspicuous and not at all shy.

Gyldenstolpe also obtained at the same place examples which he calls *belangeri* (tom. cit., p. 18) and it is probable that in separating *siamensis* he was misled by the immature characters of the skull in his type specimen.

For measurements see table *postea*.

13. *Tupaia glis cambodiana* subsp. nov.

Tupaia concolor, Kloss, P. Z. S. 1916, p. 37.

This is the animal previously referred by me, for geographical reasons, to *T. concolor* Bonhote, though I noted at the time that it was not typical; further examination leads me to regard it as distinct. Though it closely agrees with *T. concolor* in size, the mammary formula for that form is believed to be $2 - 2 = 4$, in this it is $3 - 3 = 6$

T. concolor further (*vide* Bonhote, P. Z. S. 1907, p. 7) is uniform grizzled greyish-green above and the neck-stripe is so faint that unless special search is made it is liable to be overlooked; Lyon also (Proc. U. S. Nat. Mus. 45. p. 68) does not mention any neck-stripe at all and states that the upper parts are grizzled ochraceous-buff and blackish, anteriorly more buffy, posteriorly more ochraceous, but not conspicuously so, while the tail is similar to

¹ Kungl. Sv. Vet. Akad. Handl., 57, No. 2 p. 20 (Feb. 1917).

adjacent parts of the body with five light and five blackish bands; in *cambodiana*, including the extreme base and tip of the hairs, there are only four of each, and the tail is more like the shoulders than the rump which is often suffused with ochraceous. The neck stripes are apparently more distinct than in *concolor*, but less so than in *belangeri*.

Compared with the latter it is larger and darker, the annulations anteriorly being of a deeper buff and not producing such an olivaceous effect while the rump is often more richly coloured and the rostrum is longer.

Measurements and specimens examined. See P. Z. S. 1916, pp. 36, 68.

Type. Aged female (skin and skull) No. 1841/C. B. K. Collected at Klong Yai, S. E. Siam on 6th January 1915.

14. *Tupaia glis olivacea*, subsp. nov.

Type. Adult male (skin and skull) No. 2208/C. B. K. Collected at Pak Bu near Tachin, Central Siam, on 23rd October, 1916.

Diagnosis. Colour above a grizzle of blackish and buff, producing a speckled olive effect. Neck-stripes and under-parts pale olive-buff. Tail above more coarsely annulated than the back, black more in excess and buff paler; below greyer than above, no distinct median stripe. Size rather larger than *T. g. belangeri*. Mammary 3—3=6.

Measurements: See table *postea*.

Specimens examined.:—Four from the type locality.

Remarks. Two of the specimens are more buffy below than the type and another (2207).

This is an extremely distinct animal on account of its dark greenish colouring. I can only account for it, surrounded as it is by very different coloured forms, as the result of complete isolation by the Chao Phya and Tachin rivers in a swampy area, where differential characters once evolved have become dominant since they have not been modified and brought back to the normal by contact with animals of which the greater part live under more normal conditions. It is probably for some such reason

as this that races inhabiting small islands are often more different from the general form than those occupying large areas; in a small population a divergence from the normal, once started, has a better chance of succeeding and modifying the whole than it would in a large population; in the latter also, more divergences than one may arise which may modify each other and bring the population back more to the normal once again.

CHIROPTERA.

15. *Pteropus vampyrus malaccensis*.

Pteropus vampyrus malaccensis, K. Andersen, Ann. & Mag. Nat. Hist. (8) ii, p. 368 (1908); id. Cat. Chir. Brit. Mus., I, p. 346 (1912); id. P. Z. S. 1916, p. 39.

Pteropus vampyrus intermedius, Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 11 (1916) [Krabin, Central Siam].

1 ♂, 2 ♀, Koh Mesan off Cape Liant, S. E. Siam.

23 examples, Koh Pra Noi near Satahip, S. E. Siam.

All these are undoubtedly *malaccensis*. I was, therefore, apparently wrong in thinking that the examples of this race which I obtained in S. E. Siam were there as the result of migration across the Gulf of Siam from the Malay States; and with the present material in hand I find that the specimen from Krabin determined as *P. v. intermedius* is a sub-adult *malaccensis*. It would appear more probable, therefore, that *malaccensis* ranges throughout the Malay Peninsula to South Tenasserim and thence across Southern Siam to Cambodia.

Having been lent by the Indian Museum the specimens to which the earlier references apply, I have gone into the synonymy given by Andersen in the "Catalogue" for *P. intermedius* which suggests that it occurs southward to Peninsular Siam; I find that *Pteropus javanicus* Blyth (Tenasserim) and *Pteropus medius* Blyth (S. Tenasserim) are respectively *P. hypomelanus geminorum* Miller, and a sub-adult example of *malaccensis*.* *Pteropus medius*? Miller, was a young adult placed with hesitation under that name and my own reference is to the same animal. All the remaining

* "*Pteropus edulis*" obtained by Dr. J. Andersen near Mergui (Journ. Linn. Soc. XXI (1889) p. 337.) also proves on examination to be a typical example of *P. v. malaccensis*.

references are merely citations of the unique type specimen. Andersen is now inclined to regard *intermedius* as only a sub-species of *rampyrus* (P. Z. S. 1916, p. 40) and if this is right we cannot expect to find it in areas occupied by *malaccensis*; so it looks as though the type locality of *intermedius* (Amherst, near Moulmein) is near the southern extremity of its range, which may stretch northwards through Burma towards Assam where *P. leucocephalus* Hodgs. occurs.

(For measurements see table *postea*.)

16. *Pteropus lylei*.

Pteropus lylei, Andersen, Ann & Mag. Nat. Hist. (8), 11, p. 367 (1908); id. Cat. Chir. Brit. Mus. I, p. 339 (1912).

Pteropus medius, Flower, P. Z. S. 1900, p. 339.

1 ♂ ad. Bangkok. June 1916 (Dr. Malcolm Smith coll.). No. 2471.

1 ♀ ad. 1 ♂ imm. Bangkok. October 1916. (Mr. E. J. Webb coll.). Nos. 2450-1.

These examples illustrate the variation recorded by Andersen in the "Catalogue". The two adults have the breast and the belly blackish, becoming bone-brown on the sides and slightly grizzled throughout; the back blackish grizzled with silvery; and the head as far as the ears about auburn, becoming black on the cheeks and throat. Dr. Smith's specimen has the mantle buffy, the anterior sides of neck and a median area on the foreneck tinged with Sudan brown. Mr. Webb's female has the mantle and neck Sudan brown suffused with auburn brown in front. The immature male has the back as in the adults, the head Sudan brown blending with a buffy mantle and the sides and front of the neck suffused with amber brown; the throat is black; the hairs of breast and belly are blackish at base with ochraceous tips, the ventral area alone being dark brown; this young animal (skull, 58.5; forearm, 138 mm) resembles specimens of *P. giganteus* (Brumm.).

Pteropus lylei does not appear to develop a sagittal crest. The two larger specimens are quite adult with the teeth worn and the basioecipital suture completely obliterated, but the ridges on the cranium are 4 - 5 mm apart.

This species is apparently the common flying-fox of Bangkok, whence no other has been recorded. It has been taken at Petchaburi to the south-west and extends eastward to Saigon.

(For measurements see table *postea*.)

17. *Cynopterus angulatus*.

Cynopterus angulatus, Miller, Proc. Nat. Acad. Sci. Philadelphia, 1898, p. 316.

Cynopterus brachyotis angulatus, Andersen, Cat. Chir. Brit. Mus. 1, p. 611 (1912); id. P.Z.S. 1916. p. 40; Wroughton, Journ. Bombay Nat. Hist. Soc. XXIII, p. 702 (1915).

3♂ ad., 5♀ ad., 1♀ subad. Bangkok, Oct. 1916.

None of the animals in this series exhibit a sagittal crest but all seem adult except the last.

Leaving the ears out of the question—measurements of which may be rendered inaccurate either through the personal equation of the worker or through distortion in preservation—these specimens are evidently not *sphinx*, judging by the ratio of rostrum to length of skull, as in that species the length of the rostrum (orbit to nares) is more than one-fourth the total length (*vide* Andersen, *op. cit.* p. 612).

I record them therefore as *C. angulatus*, though the ears are large while the other dimensions show that they are equal in size to smaller examples of *sphinx* (see below). The measurements of three adults collected by Mr. G. C. Shortridge at Tenasserim Town and Bankachon, Tenasserim, are also given.

		Siam.	Tenasserim
Skull, lambda to gnathion	...	31.5—32.7	31.0—31.3
„ condylo-basal length	...	30.4—31.1	30.0—30.2
„ rostrum	...	7.6—8.0	7.1—7.2
Mandible	...	24.8—26.0	23.3—25.9
C—M1, crowns	...	10.1—11.0	10.0—10.7
Forearm	...	65.0—69.0	71.0—76.0
3rd digit, metacarpal	...	44.0—45.7	44.7—49.0
„ phalanx	...	28.0—31.8	30.0—31.0
Ear from orifice	...	18.0—20.0	20.0—21.5
Tibia	...	26.0—27.0	26.5—28.2

18. *Miniopterus blepotis*.

Vespertilio blepotis, Temm., Mon. Mamm. II, p. 174 (1835).

2 ♂ ad, Koh Lak.

External measurements:—total length, 121, 118; hindfoot.

10. 2, 10. 5; ear, 12. 6, 12. 8; fore-arm 50, 49; tibia, 20, 21 mm.

19. *Miniopterus medius*.

Miniopterus medius, Thomas & Wroughton, P. Z. S. 1909, p. 382.

2 ♂, 5 ♀. Koh Lak.

External measurements, minimum and maximum of the series:—head and body, 44-52; tail, 47-51; hindfoot, 8-9; ear, 9.4-11. 8; forearm, 40.4-42.0; tibia 16.3-18.0 mm.

20. *Myotis muricola*.

1 ♂ ad. Bangkok. September 1916.

External measurements:—head and body, 45; tail, 39; hind-foot, 6.2; ear 12.8; forearm, 34; tibia, 14. 5 mm.

21. *Hipposideros larvatus*.

Rhinolophus larvatus Horsf., Zool. Res. in Java (1824).

1 ♀ ad. Koh Lak.

External measurements:—head and body, 71; tail, 30; hind-foot, 9.5; ear, 22.5; forearm, 61; tibia, 22 mm.

RODENTIA.

22. *Sciurus caniceps caniceps*.

Sciurus caniceps, Gray, Ann. & Mag., X, p. 236 (1842); Kloss, Journ. Nat. Hist. Soc. Siam, II, pp. 18, 83 (1916); Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 33 (1917).

Sciurus chrysomotus, Blyth, Journ. Asiat. Soc. Bengal, XVI, p. 873, pl. 37, fig. 1 (1847).

Sciurus epomophorus fluminis, Robinson and Wroughton, Journ. Fed. Malay States Mus. IV, p. 233 (1911).

1 ♂ ad, 1 ♀ imm. Lat Bua Kao.

These examples are in the bright winter pelage, having the upper side of the body rich Mars yellow, this colour extending over the crown of the head and down the base of the tail; they are the most easterly specimens on record. *S. c. fluminis*, of Northern Siam is apparently only this animal in dull summer pelage. The

race does not seem to occur in S. W. Siam where it is replaced by *S. c. davisoni* Bonh. and the following form.

(For measurements see table *postea*.)

23. *Sciurus caniceps inexpectatus*.

Sciurus epomophorus inexpectatus, Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 178 (1916).

Sciurus epomophorus davisoni, Gyldenstople, Kungl Sv. Vet. Akad. Handl., 57. No. 2, p. 35 (1917).

5 ♀ ad. Koh Lak.

Most nearly resembling *S. c. milleri* Robinson & Woughton from Trang, Peninsular Siam, but paler throughout.

Occiput, back and sides a grizzle of maize-yellow and black, blending into a grizzle of white and grey (silvery) on the face and limbs but the yellow brightening on the sides of the neck. Ears slightly tinged with yellowish, their backs grey to silvery. Underparts, an indistinct grizzle of white and grey with a scarcely perceptible darker median line. Axillae and groin dull buff-yellow, these areas sometimes joined by an indistinct wash of the same colour along the line of contact between side and belly. Tail like back but the grizzle coarser and tending to form bands distally, the last 50-70 mm. pure black sharp'y margined from the grizzled part.

A specimen taken in June at the same place* only differs in having the axillary and inguinal regions brighter, the latter being ochraceous-orange, and the lower median line of the tail ochraceous-buff. Seasonal variation, therefore, does not affect the general colour of the upper parts as in true *caniceps*.

It is curious to find these squirrels most resembling *milleri* of Trang, for I have a series from Chumporn, an intermediate locality, which are *S. c. davisoni* (type locality Bankachon, South Tenasserim), a race of much darker colour than either.

Type. Adult female (skin and skull) No. 2434/C.B.K. Collected at Koh Lak, S. W. Siam on 15th November 1916,

(For measurements see table *postea*.)

* Obtained by Messrs. Williamson and Smith's collectors.

24. *Sciurus atrodorsalis pranis*.

Sciurus erythraeus pranis, Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 178 (1916).

Sciurus atrodorsalis, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 35 (1917).

5♂ ad., 2♂ subad.; 6♀ ad., 1♀ subad. 2♀ juv. Koh Lak.

In the original diagnosis I referred these squirrels to *rubeculus* Lyon (regarded as a form of *erythraeus*) because in size and colour of upper parts some of them exactly resembled a specimen from Bok Pyin, South Tenasserim, from which I considered them distinct on account of their paler underparts and paler albescent-tipped tails. The type of *rubeculus* came from Trang, Peninsular Siam, and with it were associated four specimens from South Tenasserim, one of which is the above-mentioned Bok Pyin example.

Further examination shows however, that the Bok Pyin animal (and doubtless the others from the neighbourhood) is not typical; for on comparing it with a series from Tung Song and Kao Nong in the state of Nakon Sri Tamarat (the first place about 30 miles and the latter 80 miles from the typical locality, while S. Tenasserim is about 180 miles away) it proves to be less richly coloured above, while it is also intermediate in size between the smallest example of *rubeculus* and the largest of *pranis*. Northern animals, even the darkest, are much less richly coloured than the Southern ones, both above and below, and are also smaller. I think, therefore, that *pranis* is a well-differentiated form of *atrodorsalis* with which it agrees in size; there is frequently a slight blackening of the posterior back which also indicates a connection; this is quite absent in *rubeculus*.

Characters. Smaller than *rubeculus*; paler above and without the Mars-yellow suffusion on the nape and body; below, the grizzled areas much paler and the coloured parts ochraceous though sometimes washed with rufous; in *rubeculus*, however pale the coloured areas may be, there is always present a tone of mahogany-red.

Size about as in typical *atrodorsalis*, but with the median

dorsal area only occasionally slightly blackened by black-tipped hairs; head suffused with rich ochraceous, underparts yellow ochre to buff (at the most only partially tinged with burnt sienna) and divided mesially by a grizzled line,

Colour. Upperparts varying from a grizzle of buff and black to one of ochraceous and black slightly darkened on mid-back and the rump in the majority of the series; muzzle, top of head and ears varying from Mars yellow to orange buff less speckled with black than the back, the brighter heads going with the brighter bodies; the backs of the ears paler greyish yellow, ungrizzled. Hands and feet rather darker than the limbs, as dark as the back where blackened.

Underparts:—chin, throat and neck varying from yellow scarcely grizzled to a fine grizzle of buff and grey; a grizzled median line of varying breadth of the same colour as the sides of the body; the areas between the grizzled parts buff to yellow ochre, these colours extending less distinctly along the under sides of the limbs. In about 30 per cent the yellow area is suffused with burnt sienna, least on the chest, strongest on the axillary region and the thighs.

Tail varying from buff to ochraceous-orange annulated with black, the latter forming distinct bands distally except on the last inch or so where the hairs have long buffy or albescent tips; whiskers black.

Those specimens which have more richly coloured underparts are also, on the whole, more richly coloured throughout.

Remarks. This is obviously a variable squirrel, though not, I think, a race of true individual variation, but rather one in which each animal goes through a cycle of change; as this change, however, does not seem to take place at a time common to all, it cannot be considered seasonal. The absence of any such occurrence is shown by three examples taken in June*; one of them is indistinguishable from examples of the November series and the others only differ in having the heads duller (yellow ochre).

* Coll. Messrs. W. J. F. Williamson and M. A. Smith.

Two young animals are as brightly coloured above as the adults but are much less speckled with black, below they are yellowish slightly tinged with burnt sienna except for the neck and median line.

Type. Adult male (skin and skull) No. 2395/C.B.K. Collected at Koh Lak, S. W. Siam on 9th November, 1916.

(For measurements see table *postea*.)

25. *Sciurus atrodorsalis tachin*.

Kloss, Journ Nat. Hist. Soc. Siam. ii, p. 178 (1916.)

9♂ ad. 6♀ ad. 1♀ imm. Pak Bu, Tachin, Central Siam.

A form of *Sciurus atrodorsalis* Gray, remarkable for small size and rare development of a black dorsal patch.

Above a grizzle of black and yellow, the latter ranging from antimony yellow to cream, but the general colour effect very variable owing to the very variable amount of black speckling. Muzzle rather brighter than the back and less blackened; limbs grey and duller.

In rather less than half the series there is a slight darkening of mid-back and rump, owing to the presence of more distinctly black-tipped hairs, and in one specimen this darkening takes the form of an elongate black patch, though only the tips of the hairs are blackened,

Ears generally tawny, sometimes a tawny ring round the eye and the muzzle tinged with the same colour; backs of ears buffy-grey. Hands and feet generally, though not always, darker than the limbs.

Chin, throat and chest a grizzle of buff and grey which extends backwards as a median line broadest on the chest; rest of underside of body with limbs varying from burnt sienna throughout, or zinc orange, or bright yellow-ochre suffused with ferruginous on the thighs. In three or four examples the yellow is much reduced and very faint.

Tail usually black and faint buff forming bands distally, most distinct towards the tip which is generally albescent. In the immature animal the annulations are obscured by a wash of

orange-buff not extending to the tip. The black-backed specimen, which is the type, has this suffusion to a less degree.

When first obtained the small size of this squirrel obscured its relationship, but towards the end of my visit the black-backed specimen was collected and this development appears to indicate an undoubted affinity with *atrodorsalis*. In colour the race more nearly resembles the large *S. a. zimmeensis* (Rob. & Wr.) of North Siam¹ and *S. a. shanicus* Riley, of the Shan States,² than the geographically nearer typical form of Moulmein or *S. a. thai mihi*, from Raheng.³

Two specimens collected in May by Dr. Malcolm Smith do not differ from examples taken in November.

Type. Adult female (skin and skull). No. 2213/C. B. K. Collected at Pak Bu, Tachin, Central Siam on 23rd October, 1916.

(For measurements see table *postea*)

26. *Sciurus nox*.

Sciurus nox, Wroughton, Ann. & Mag. Nat. Hist. (8) II, p. 396 (1908); Kloss, Journ. Nat. Hist. Soc. Siam, I, p. 227 (1915); id., op. cit., II, p. 17 (1916).

13♂ ad. 3♀ ad. Satahip, near Cape Liant.

The types of this species came from Sriracha on the east coast of the Inner Gulf of Siam about 30 miles S. E. of the Chao Phya river mouth, and it remained unknown elsewhere until I received specimens from Hup Bon and Nong Khor, a few miles inland. It would thus appear to have a very small range and to be practically confined to a triangular piece of country of which Cape Liant is the apex.

It is a very stable animal, always entirely black, and shows no tendency to intergrade with any other form. Its nearest relation seems to be *S. albivexilli* mihi, from Koh Kut, Chantabun Archipelago, which only differs in the possession of a white tail-tip, rather shorter tail and hind foot and slightly larger skull.

1. Journ. Fed. Malay States Museums, VII, p. 91 (1916).
2. Journ. Bombay Nat. Hist. Soc. XXII, p. 663 (1913)
3. Journ. Nat. Hist. Soc. Siam, II, p. 285 (1917).

S. ferrugineus cinnamomeus Temm., has been taken in company with it at Hup Bon, but I did not meet with it at Satahip.

(For measurements see table *postea*.)

27. *Sciurus finlaysoni tachardi*.

Sciurus finlaysoni, Kloss, Journ. Nat. Hist. Soc. Siam, I, p. 157 (1915); id. op. cit. II, p. 16 (1916).

Sciurus finlaysoni finlaysoni, Kloss, op. cit. I, p. 225 (1915); id. op. cit. II, pp. 13, 179 (1916); p. 345 (1917).

Callosciurus finlaysoni tachardi, Robinson, Journ. Fed. Malay States Mus. VII, p. 36 (1916); Thomas, Journ. Nat. Hist. Soc. Siam. II p. 343 (1917).

7♂ ad. 7♀ ad. Lat Bua Kao.

This is a somewhat variable form. The general colour on the upper parts of the head and body is buffy-white to buffy with grey bases to the hairs. Usually the buff is so much in excess that the animals appear to be of that colour, and the grey bases of the hairs are hardly visible unless the fur is disturbed; but in some examples the grey has so spread up the hairs that the effect is almost that of a grey-backed animal much washed with buff. Examples having the latter appearance, with which age and sex have nothing to do, may indicate an approximation to *S. nox* (though grey-based hair is common to many squirrels), and since the two have not been found side by side, *nox* may be nothing more than a very distinct geographical race of *finlaysoni*.

Though *S. f. cinnamomeus* Temm., occurs towards Northern Siam and at Chantabun together with the white squirrel,* I did not meet with it at Lat. Bua Kao where the present form was the common squirrel.

Messrs H. C. Robinson and Oldfield Thomas have recently had some discussion with me as to the type locality of *Sciurus finlaysoni finlaysoni*; I having held (following Anderson) that it came from the mainland, they that it was taken on Koh Si Chang in the Gulf of Siam: and though I do not consider that their arguments have fully proved their contention I am now able to settle the point in their favour. In his "Embassy to Siam and Cochin China"

* *vide* Wroughton, Ann. and Mag. Nat. Hist. (8) pp 394, 397 (1908).

Crawford writes of the Si Chang Islands, "The only quadrupeds which we observed on these islands, were a large species of rat, and a small squirrel about a foot long. This last was numerous in the forest, and we obtained several specimens. It was of a milk-white colour, the paws excepted, which were black. "(2nd Ed. Vol. I, pp. 296, 7 (1830), and in a footnote states, "This appears to be a new species, and Dr Horsfield has appropriately named it after the late Mr. Finlayson."

(For measurements see table *postea*.)

28. *Sciurus finlaysoni trotteri*.

Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 178 (1916).

10♂ ad. 2♂ imm., 11♀ ad. 1♀ imm. Koh Lan, Inner Gulf of Siam.

Like *S. f. folletti mihi*,¹ but darker; tail not banded and underparts without any distinct rufous areas.

Upper parts:—hairs at base neutral grey on the back, paler on the head and side; the distal halves dirty yellowish white (pale olive buff) the extreme tips black. The middle back is generally blacker owing to local reduction of the pale annulations, but this dark area is very variable in extent and in two or three animals is practically absent. The limbs and sides of the head and neck are grey slightly tinged with brown and finely and faintly grizzled with whitish; hands and feet blackish slightly grizzled; ears like the head, their backs grey bordered with whitish.

Below a variable sullied grey largely grizzled, but axillary and inguinal regions and the undersides of the thighs whitish. The median line is slightly darkened and the underparts are faintly margined from the sides.

Tail cream-colour generally grizzled with black at the base, the central hairs of the pencil black. Some of the hairs between base and tip have faintly blackened ends and the median line of the underside is nearly always somewhat blackened—in many specimens markedly so.

In a few animals there are indications that rufous areas may occur down the median line of the chest and abdomen and at the

¹ Journ. Nat. Hist. Soc. Siam. I. p 159 (1915)

axillary region, but none of the series possess the rufous patches seen in some examples of *S. f. folletti*; as compared with that race the dark element is much increased and the colour effect is much less of a pale olive buff.

Young animals resemble adults but have the grizzle of the upper parts much finer and the pale colour reduced in quantity.

There appears to be no seasonal variation in these squirrels. The type series of *folletti* was taken in February, and I have lately been sent a set obtained in July by Mr. W. J. F. Williamson's collector; there is no difference between two lots; in both the great majority are without rufous colouration and in both two or three individuals exhibit rather irregular patches of rufous (principally inguinal and axillary) on the underparts.

Type Adult male (skin and skull) No 2266/C. B. K. Collected on Koh Lan, Inner Gulf of Siam on 29th October, 1916.

(For measurements see table *postea*).

Named after Mr. E. W. Trotter, Major-General of Gendarmerie, Siam, who was the first to collect specimens of this Koh Lan squirrel.

29. *Tamiops macclellandi liantis*, subsp. nov.

Type. Adult female (skin and skull) No. 2337/C. B. K. Collected at Satahip near Cape Liant, S. E. Siam on 2nd November 1916.

Characters. A race nearest *T. m. rodolphi* (M-Edw.), from which it differs in having the outer pale stripes continued without interruption or diminution over the shoulders: in the Cochin-China animal these stripes instead of being continuous from muzzle to rump are either broken on the shoulders or very much reduced there.

Colour. Forelimbs and sides greyish strongly suffused with buff, the hairs with grey bases and buffy tips. Four yellow stripes on the back; the outer pair pale cream extending from the base of the tail to the muzzle passing below the ear and eye but above the vibrissae where they are duller in colour: the inner pair, commencing indistinctly at the shoulder and extending to the base of the tail, ochraceous-buff anteriorly, warm buff on the rump. On the

body the outer yellow stripes are bordered externally by a line of blackish-ochraceous; the crown and nape are deep ochraceous-tawny speckled with blackish as are the areas between the pale stripes on the anterior half of the back but on the posterior part of the back these areas become black stripes, the outer dark pair being slightly speckled with ochraceous.

Chin whitish, throat and undersurface of body and limbs ochraceous-orange washed with deep ochraceous-salmon on the abdomen. Hands and feet, ears and top of muzzle warm buff; back of ears black, the hairs near the base anteriorly and at the tip white, those on the posterior half black with white extremities and elongated. Tail annulated black and ochraceous-buff, the tips of the hairs white; extremity of tail black.

Skull and teeth. Do not differ materially from those of *T. m. rodolphi*.

Specimens examined. The type, and an example from Krabin about eighty miles east of Bangkok.

Measurements. Collector's external measurements:—head and body, 118; tail, 117; hindfoot, s. u., 27.5; ear, 13.5. Skull:—greatest length, 32; condylo-basilar length, 25.5; palatilar length, 12; diastema, 6.0; upper molar row (alveoli), 6.1; median nasal length, 7.6; least interorbital breadth, 12; zygomatic breadth, 19.5; greatest breadth of combined nasals, 3.9 (5.5 in the example from Krabin)

Remarks. The specimen from Krabin, about 100 miles to the north of Cape Liant and taken on the same day of the previous year, (vide *T. rodolphi*, Journ. Nat. Hist. Soc. Siam, II (1916) p. 21) differs in having the head, neck and shoulders paler (i. e. ochraceous-buffy), and the inner yellow stripes also paler, while the dark stripes are all grizzled though the median one is blackest: the sides and hind-limbs are also greyer and buffy; there is, however, a considerable variation of this kind in a series of *T. m. rodolphi* topotypes, in which paler inner stripes are also correlated with paler shoulders, sides and limbs.

Both *T. m. rodolphi* and *liantis* differ from *T. m. novemlineatus* of Peninsular Siam and *kongensis* of North Siam, in having

much broader and more grizzled dark stripes which do not extend so far anteriorly.

30. *Menetes berdmorei*.

With 52 specimens available it appears possible to recognise the following continental races in Siam:—

a. MENETES BERDMOREI BERDMOREI.

Sciurus berdmorei, Blyth. Journ. Asiat. Soc. Bengal. XVIII, p. 603 (1849)

Menetes berdmorei berdmorei, Thomas, Journ. Bombay N. H. Soc. XXIII, p. 23 (1914); Kloss, Journ. N. H. Soc. Siam, II, p. 23 (1916)

Dark dorsal stripes present but not conspicuous; undersurface strongly buffy.

Specimens examined:—Four from Martaban and Mergui, Tenasserim (ex coll. Indian Museum); two from Klong Bang Lai, Patiyu¹ S. W. Siam (January); three from Hua Hin, Pran¹ S. W. Siam, (June).

For measurements see Kloss, *loc. cit.*, and table *postea*.

The specimens from Tenasserim and Patiyu have the characters given above; the Pran examples, which were taken at midsummer, are very different. They are extremely pale and dull-coloured animals with the sides of the head and the extremities of the limbs greyish; there are no dark dorsal stripes and the areas between the yellow lateral stripes, which are pale, are of the same colour as the back; the under-parts are pure white. Hua Hin is in the same latitude as Mergui and only a hundred miles north of Klong Bang Lai and it seems at present premature to regard these examples as distinct.

Distribution:—Rangoon, (Burma) to Patiyu, S. W. Siam; (typical locality, Moulmein).

b. MENETES BERDMOREI MOUHOTTI.

Sciurus mouhoti Gray, P. Z. S. 1861, p. 137

Menetes berdmorei mouhoti, Thomas, Journ. Bombay N. H. S. XXIII, p. 23 (1914); Kloss, P. Z. S. 1916, p. 48; id. Journ. N. H. S. Siam, II, p. 84 (1916).

1. Messrs W. J. F. Williamson and M. A. Smith's collectors.

Dark dorsal stripes less conspicuous than in *berdmorei*; underparts white tinged with yellow.

Specimens examined:—Seventeen from S. E. Siam (Chantabun town to the Cambodian boundary on coast).

For measurements see Kloss, *loc. cit.*

My specimens, though not topotypes, doubtless more nearly represent the typical animal taken by Mouhot in "Cambodia" than any others since recorded. One of them has the underparts as strongly buffy as winter examples of *berdmorei*.

Distribution:—S. E. Siam and Cambodia.

c. *MENETES BERDMOREI KORATENSIS.*

Menetes berdmorei, Gyldenstolpe (partim), Arkiv. för Zoologi, 8, No. 32, p 15 (1916).

Menetes berdmorei berdmorei, Kloss (partim), Journ. N. H. Soc. Siam. II. p. 23 (1914).

Menetes berdmorei koratensis, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2. p. 39 (1917)

Dark dorsal stripe generally more conspicuous than in *mouhoti* and *berdmorei*; underparts white, less tinged with yellow than in *mouhoti*.

Specimens examined:—One from Krabin,¹ Central Siam; two from Hup Bon,¹ and three from Satahip, S. E. Siam; four from Lat Bua Kao, E. Siam.

For measurements see Gyldenstolpe and Kloss, *loc. cit.* and table *postea*.

This race is based on two specimens taken at Sakerat, south of Korat town, and not far from Lat Bua Kao: the characters assigned are small hind-foot and short muzzle (Hf, 36; greatest length of skull, 46.1 mm.); underparts pure white anteriorly, slightly yellowish posteriorly; no dark median dorsal stripe and the areas between the buffy side stripes of the same colour as the upper parts.

The description applies fairly well to my immature juvenile examples and the measurements given suggest that the author had immature specimens before him.

¹ Messrs. W. J. F. Williamson and M. A. Smith's collectors.

My three adults from Eastern Siam vary considerably; in one the median and lateral dorsal lines are very pronounced and the area between the buffy stripes is black; in another the median dark line is absent and the lateral lines much reduced while the area between the buff stripes is much grizzled and scarcely darker than the upper parts; the third is intermediate.

Of the young animals, one is without any indication of black stripes on the back and the inter-buff lateral area is concolorous with the upper surface: in the other the back is slightly darkened above the buff stripes, and the areas between them are slightly darkened also. The under-parts are yellowish-white in the adults: white, slightly tinged with yellowish posteriorly, in the younger animals.

The Krabin, Hup Bon and Satahip specimens closely resemble the E. Siam adults (of which those from Lat Bua Kao are practically topotypes) except one adult from Satahip which agrees with the young Lat Bua Kao examples in being without dark stripes: the Satahip juvenile, on the contrary, is heavily striped like E. Siam adults.

The race was compared with *consularis* from which it differs considerably; it is, however, nearest *mouhoti* from which it is not very strongly separated.

Distribution:—Eastern Siam south to the western parts of S. E. Siam (typical locality south of Korat town).

d. *MENETES BERDMOREI CONSULARIS*.

Funambulus berdmorei, Bonhote, P. Z. S. 1900, p. 56.

Menetes berdmorei consularis, Thomas, Journ. Bombay N. H. Soc. XXIII, p. 24 (1914); Kloss, Journ. N. H. Soc. Siam, II, p. 86 (1916); Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl. 57, No. 2, p. 38 (1917).

No dark dorsal stripes; underparts pure white, the bases of the hairs sometimes grey and the genital region and the inner sides of the thighs sometimes suffused with buff.

Specimens examined:—Two from Muang Prae,¹ N. Siam, and three from Raheng,² W. Siam.

¹ Messrs W. J. F. Williamson and M. A. Smith's collectors.

² Coll. Mr. K. G. Gairdner.

For measurements see Thomas, Kloss and Gyldenstolpe, *loc. cit.*, and table *postea*.

Mr. Thomas' statement that the underparts are yellowish white is not confirmed by the specimens examined by Bonhote, Gyldenstolpe and myself, which were obtained between February and June.

Distribution:—The northern parts of Siam (typical locality, Nan).

e. MENETES BERDMOREI PENINSULARIS.

Menetes berdmorei, Robinson and Kloss, Journ. Federated Malay States Museums, V. p. 121 (1914).

Dark dorsal stripes very conspicuous; underparts white washed with orange-buff, strongest posteriorly.

Specimens examined:—Thirteen from Ban Kok Klap, Nakon Sritamarat, Peninsular Siam.

For measurements see Robinson & Kloss, *loc. cit.* and table *postea*.

This race differs from *berdmorei* in the much more pronounced black dorsal stripes and lighter dorsal region which is often of a colour between Xanthine orange and amber brown, while the underparts are white, but washed with a more intense yellow than the buffy undersurface of *berdmorei*.

Type:—Adult male (skin and skull) F. M. S. Mus. No. 109/13. Collected at Ban Kok Klap, Nakon Sritamarat, Peninsular Siam, on 3rd July by H. C. Robinson and E. Seimund.

The definition of this race is to be attributed to Mr. H. C. Robinson and myself.

31. *Rattus sabanus herberti*.

Epinys vociferans herberti, Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 25 (1919).

1♂ ad. Lat Bua Kao.

This race differs from the typical animals of Peninsular Siam in being duller above with the white of the undersurface extending on to the muzzle and up the cheeks towards the eyes. The present specimen, which is practically a topotype, is darker above than the original animal with much more black in the composition of the pelage.

(For measurements see table *postea*).

32. *Rattus rajah surifer*.

Mus surifer, Miller, Proc. Biol. Soc. Washington XIII, p. 148, pl. IV, figs 4, 4a, 4b (1900).

Epimys surifer, Woughton, Journ. Bombay Nat. Hist. Soc. XXIII, p. 714 (1915).

Epimys surifer surifer, Kloss, Journ. Nat. Hist. Soc. Siam, II, p. 26 (1915)

1 ad. Koh Lak.

This example (with others from Maprit in Patiyu, and specimens I have seen from Bangkok, S. Tenasserim) is scarcely typical, being a trifle less brilliantly coloured than the race from Peninsular Siam (thus showing a slight approach to *R. s. finis* and *R. s. siama*), but is best ranked with the original continental form.

(For measurements see table *postea*).

33. *Rattus rajah finis*.

Epimys surifer finis, Kloss, P. Z. S., 1916, p. 51; id. Journ. Nat. Hist. Soc. Siam, II, p. 85 (1916).

3♂ ad., 5♀ ad., 1♂ imm. Satahip, S. E. Siam.

A series of fine adult animals, the majority showing well-worn teeth: No. 2387 being the largest specimen of *R. rajah* I have seen. The skulls are apparently rather broader than in *R. r. surifer* of Peninsular Siam, and the tooth-rows are parallel, or even diverge a trifle posteriorly, instead of converging.

(For measurements see table *postea*).

34. *Rattus rajah koratis*, subsp. nov.

Specimens examined. 6♂ ad., 8♀ ad., Lat Bua Kao.

Diagnosis. Darker and duller than *R. r. finis*, more heavily blackened above and the yellow element less brightly ochraceous; white of underparts extending up the sides of the muzzle and to the hindfeet, the wrists and forearms often white above.

Skull not essentially differing from *R. r. finis*; the upper tooth-rows parallel.

Type. Adult male (skin and skull) No. 2187/CBK. Collected at Lat Bua Kao, E. Siam on 18th October 1916.

Measurements. See table *postea*.

Remarks. The characters noted seem common to all the examples obtained at Lat Bua Kao, so that animals from this locality may be regarded as representing a distinct local race. Specimens from the range of hills which separate the Central Siam plain from the Korat basin, which I have recorded as *finis*¹ are somewhat variable, and this locality seems to be part of the region where one form merges into the other.

35. *Rattus rajah kramis*, subsp. nov.

Specimens examined. 4♂ ad., 3♀ ad., 1♂ subad. and 2 juvenile examples from Koh Kram in the Inner Gulf of Siam.

Diagnosis. Rather smaller than neighbouring races of *R. rajah*. Paler and yellower than *R. r. finis* with the black element disposed somewhat patchily; white of underparts extending to fore and hind-feet.

Upper tooth-rows always longer than the palatal foramina and slightly converging posteriorly; supra-orbital ridges more deflected than in *finis* of the adjacent mainland and with more markedly angular projections at the terminations of the fronto-parietal sutures; palatal foramina smaller.

Type. Adult male (skin and skull) No. 2277/C B K. Collected on Koh Kram, Inner Gulf of Siam on 30th October 1916.

Measurements. See table *postea*.

36. *Rattus rattus neglectus*.

Mus neglectus, Jentink, Notes Leyden Museum, II, p. 14 (1880). (Borneo).

Mus rattus, Flower, P. Z. S. 1900, p. 361.

Epinys rattus, subsp., Kloss, P. Z. S., 1916, p. 55; id. Journ. Nat. Hist. Soc. Siam, II, p. 26 (1916); id. tom. cit., p. 85.

Rattus rattus jalorensis, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl. 57. No. 2, p. 43 (1917).

5♂, 3♀ Tachin.

1♂, 1♀ Koh Lak.

Colour above varying from pale ochraceous or bright tawny slightly streaked with black to tawny much blackened; below white,

¹ *Epinys surifer finis*, Journ. Nat. Hist. Soc. Siam, II, p. 26 (1916).

sometimes tinged with grey on the sides and middle line; feet white: a considerably brighter coloured series than that I previously obtained in S. E. Siam. Mammæ $3 - 2 = 10$.

There is a noticeable amount of individual variation, but I can see no constant differences amongst the rats of this kind from the southern parts of Siam, the Malay Peninsula, Sumatra and Borneo; and it seems most advisable therefore to regard all as *R. v. neglectus*. There are, however, marked tendencies for animals from the west and north of Siam to be yellower and brighter than those from the south and east, which are browner and duller and more nearly agree with *neglectus* (*jalorensis* Bonhote, of the Malay Peninsula); while the former *Rattus rattus thai* mihi,¹ with $3 - 3 = 12$ mammae) approximate to *sladeni* Anderson, from the neighbourhood of Bhamo, which also has $3 - 3 = 12$ mammae but smaller bullae. *Sladeni* is possibly very close to *robustulus* Blyth, from Schwe-gyin, which also has small bullae.

My series was taken near the shores of the Inner Gulf of Siam from Islands in which (Koh Si Chang and Koh Phai) I have described the races *R. v. portus* and *R. v. poenitentiari*²; both are consistently yellower and paler than the adjacent mainland animal, the underparts slightly more tinged with yellowish and the feet whiter; the former island race is larger and the latter of about the same size as the mainland animal but with larger teeth and palatal foramina.

(For measurements see table *postea*.)

37. *Rattus rattus lanensis*, subsp. n. v.

Specimens examined:—1♂, 4♀ ad. and subad., 7 imm. and juv. examples from Koh Lan, Inner Gulf of Siam.

Diagnosis. Colour consistent, about the same above as in the lighter, yellower individuals of the mainland, but white of underparts slightly tinged with yellow. Size and skull about the same but teeth larger and palatal foramina extending further backwards. Duller and darker than *R. v. poenitentiari* mihi.

¹ Journ. N. H. Soc. Siam, 11, p. 286 (1917).

² op. cit., 1, pp. 221, 2 (1915).

Type. Adult female (skin and skull) No. 2261/CBK. Collected on Koh Lan, Inner Gulf of Siam on 29th October, 1916.

Measurements. See table *postea*.

38. *Rattus rattus kramensis*, subsp. nov.

Specimens examined. 3♂ ad., 2♀ ad. Koh Kram, Inner Gulf of Siam.

Diagnosis. Colour consistent above and a shade deeper than in *R. r. lanensis*, but without any faint yellow tinge below; underparts tinged with pale grey at the sides, feet slightly yellowish. Skull very similar to the mainland form but the zygomatic and infraorbital plate averaging a little wider; scutes of tail coarser.

Type. Adult female (skin and skull) No. 2281/CBK. Collected on Koh Kram, Inner Gulf of Siam on 30th October, 1916.

Measurements:—See table *postea*.

39. *Rattus rattus mesanis*, sub p. nov.

Specimens examined:—11♂ ad., 11♀ ad., 5 imm. and juv. individuals from Koh Mesan, near Cape Liant, S. E. Siam.

Diagnosis. Colour practically consistent above and as in medium animals from the mainland; below white, sometimes slightly grey at the sides; feet very white. About the same size as *R. r. portus mihi*, but the supraorbital ridges more pronounced and angular, nasals a little smaller, palatal foramina larger and the tooth-rows hardly diverging posteriorly. About the same size also as *R. r. mikensis mihi*, (P. Z. S., 1916, p. 55), from the Chantabun Archipelago, but skull narrower and palatal foramina smaller, bullae larger, parietal ridges more parallel, colour rather less darkened above mesially, the undersurface, if silvered, much less so and the metapodials without dark centres.

Type:—Adult male (skin and skull) No. 2320/CBK. Collected on Koh Mesan Island near Cape Liant, S. E. Siam on 2nd November, 1916.

Measurements. See table *postea*.

40. *Rattus rattus koratensis*, subsp. nov.

Specimens examined:—1♀ ad., 1♀ imm. from Lat Bua Kao, East Siam.

Characters.—A general colour resemblance to the "rattus" rats of the southern parts of Siam but the skull relatively broader and the bullae much smaller. Mammæ $3-3=12$, as in *R. r. thai* mihi, from Central Siam, but the skull broader throughout and the bullae smaller while the colour of the upper parts is darker.

Colour. Above mingled bright ochraceous-tawny and blackish, the sides greyer; below white. Feet white, the metapodials slightly darkened mesially. Tail brown.

Skull and teeth. Like those of *R. r. neglectus* of Siam but the skull markedly broader in all respects—palate, zygomata, basi-occipital, etc.; nasals broader, flatter, more spatulate anteriorly; bullae considerably smaller and less dilated; palatal foramina large. As compared with *R. r. thai* there is less difference in the size of bullae but the skull characters and the colour distinguish it.

Measurements. See table *postea*.

Remarks. The external colour differences are hardly sufficient to separate this race from the local *neglectus* rat and I might have regarded the number of mammae as abnormal, but the skull is so different in its greater relative breadths, shape of nasals and diminutive bullae, that there is no doubt of its distinctness.

The immature female is dark brown above and dark grey on the sides, only slightly speckled,

Type. Adult female (skin and skull) No. 2196/ C. B. K. Collected at Lat Bua Kao, East Siam on 19th October 1916.

41. *Rattus concolor*

Mus concolor, Blyth, Journ. Asiat. Soc. Bengal, XXVIII, p. 295 (1859).

Epimys concolor, Kloss, P.Z.S. 1916, p. 57.

Rattus concolor, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl. 57, No. 2, p. 45, (1917); Kloss, Journ. N. H. Soc. Siam, III, p. 62 (1918).

6 adult and 2 immature examples from Koh Lan.

Evidently a common house animal for the village children, seeing that I wanted rats, brought this species in large numbers in a very short time; the majority, however, were young examples taken from the nest.

I have examined Blyth's original series (*vide* Records Ind.

Mus. XIII, p. 7) but it is of so unsatisfactory a nature that it would be unwise to make any remarks about examples from other localities before good topotypes have been obtained. Gyldenstolpe states that specimens from Koh Lak are absolutely similar to true *Rattus concolor* from the Malay Peninsula, but the latter are not necessarily typical and a specimen from Tioman Island, Pahang, doubtless derived from the mainland or Singapore, has been named *pullus* by Miller.

The measurements of my largest specimen are (No. 2235, ♂):—Head and body, 123; tail, 155; hindfoot, s.u., 25; ear, 16. Skull:—greatest length, 31; condylo-basilar length, 27; diastema, 8; upper molar row (alveoli), 5.4; length of palatal foramina, 5.9; median length of nasals, 11; combined breadth of nasals 3.3; zygomatic breadth, 15 mm.

I take this opportunity to make a few remarks about Gyldenstolpe's recently described form *Rattus sakaratensis* from Eastern Siam (*tom. cit.*, p. 46, pl. VI, figs 6 and 9) erroneously said to be related to *R. concolor* with which, and with *R. concolor ephippium*, it has been compared. It is obviously a member of the "jerdoni" group and if nothing nearer was available should have been referred to *whiteheadi* of which the author possessed examples from Borneo and from the Malay Peninsula ("*asper*" Miller). The figures of the skull agree exactly with skulls of these Malaysian animals but there are differences as regards the pelage. Amongst these the tail is said to be "blackish brown throughout and clothed with short hairs"; the only species of "jerdoni" rat known to me with the former character is *cremoriventer*; that is, however, a much larger animal with a longer, narrower skull and the tail is much longer than the head and body and almost pincillate; the spines are extremely numerous and strong while in *sakaratensis* they are few and feeble; though the skull and dimensions are those of *whiteheadi* (*asper*) the colour is rather that of *cremoriventer*.

42. *Bandicota siamensis*, nov.

Type. Adult male (skin and skull) No. 2218/UBK. Collected at Tachin, Central Siam on 23rd Oct., 1916.

Characters. Pelage apparently resembling that of *B. mordax*. Thomas, from Chiangmai, N. Siam,* but skull broader with longer nasals; toothrow shorter and *m*¹ narrower.

Colour. Top of muzzle, occiput, orbital region and shoulders brownish-black, the under-fur being mouse grey to clove-brown; from shoulders to rump the under-fur—neutral grey at base, hair-brown at tip—is overlaid by long glistening brownish-black piles which attain a length of 60-70 mm, on the rump. Fur of sides of head and body with neutral-grey bases and mouse-grey tips, thickly beset with (1) longer blackish hairs, and (2) longer buffy-white hairs with faintly indicated black tips; the latter sort occurring to a much less degree on the dorsal region. Upper sides of fore and hind limbs blackish-brown with a few whitish hairs bordering the claws.

Throat and lower cheeks nearly light neutral-grey, the general colour effect of the remainder of the underparts mouse-grey slightly silvered by the whitish tips of many of the hairs.

Tail dark brown, coarsely haired, with eight rings of scales to the centimetre at mid-length.

Skull and teeth. The measurements of the skull show that it is somewhat broader than the type of *B. mordax* and has longer nasals. The teeth are smaller than in the latter where their large size, especially in breadth, is the main character on which the species is erected.

As compared with the skull of an adult female of *B. setifera* (Horsf.) from Indramaju, Java, which is slightly smaller, the infra-orbital plate and the posterior root of the zygoma are narrower and the zygomatic space is larger; the palatal foramina are more narrowed posteriorly and the bullae are noticeably smaller; the nasals are larger; the teeth are not so broad and the upper rows exhibit greater convergence anteriorly.

* Journ. Bombay Nat. Hist. Soc., XXIV, p. 42 (1916).

Measurements. External measurements taken in the flesh :—

		<i>siamensis</i>	<i>mordax</i>	<i>setifera</i>
Head and body ...	...	279	228	230*
Tail ...	...	246	230	195*
Hind foot, s.u. ...	...	55	52	53*
Ear ...	...	31	31	30*
Skull :—				
Greatest length ...	...	60	—	59
Condyllo-basilar length ...	...	55	55.3	54
Basilar length ...	...	51.9	—	50.2
Palatilar length ...	...	30.9	30.0	29.9
Length of palatal foramina ...	...	11	11	11
Diastema ...	...	18.3	—	17.7
Nasals ...	...	22.9 x 7.0	21.0 x 6.8	20.9 x 6.0
Interorbital breadth ...	...	8.0	7.4	8.7
Breadth between ridges on parietals ...	...	13.0	12.4	11.0
Zygomatic breadth ...	...	32	30	—
Upper tooth row, crowns ...	...	9.0	10.8	9.2
„ „ „ alveoli ...	...	11.5	—	11.1
Breadth of m^1 ...	...	3.4	3.8	3.6

Specimens examined. One, the type.

Remarks. This animal seems to be closely allied to *B. setifera* and *B. mordax*. In addition to cranial and dental differences it seems to be rather larger than either, and darker in colour than *setifera*, while its undersurface is mouse-grey against the “slaty-grey” of *mordax*.

The specimen was trapped in the rice fields (where it lived in burrows) surrounding the village of Pak Bu near Tachin.

43. *Cannomys minor*.

Rhizomys minor, Gray, Ann. & Mag. Nat. Hist. X, p. 226 (1842); Bonhote, P. Z.S. 1900, p. 195; Gyldenstolpe, Arkiv för Zoologi. 8, No 23, p. 19 (1914).

Cannomys minor, Thomas, Ann. & Mag. Nat. Hist. (8) XVI, p. 316,7 (1915).

* from spirit specimen.

Cannomys minor lonnbergi, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No 2, p. 47 (1917).

2♀ ad. Lat Bua Kao, E. Siam. Nos 2149, 2150.

3 ad., lat. 14° 37', long. 98° 30' Western Siam. Nos. 2533-5

[Mr. A. J. Irwin] (Skins and skeletons.)

1♂ subadult. North of Lakon Lampang, N. Siam. No. 2467.

[Mr. P. A. R. Barron.]

1 skin without skull, Me Chang, Lakon Lampang. No. 2468.

[Mr. K. G. Gairdner] (hind foot in dried skin, 28.5: tail, 55.)

No 2467 is younger than the others with the parietal ridges 9-10 mm. apart: in the rest the greatest distance between these is 4 mm. at most (in No. 2535, the oldest): in none have the ridges joined to form a sagittal crest as in the obviously very aged example of *badius* figured by Anderson ¹.

The East Siam animals differ from the others in the following respects:—the fronto-parietal ridges are much more distinct, especially on the frontals, and are not pinched together posteriorly; the sutures about the nasals, both median and lateral, are much more open (in No. 2533 they are nearly obliterated mesially) and the occiput makes a more acute angle with the floor of the skull. These slight differences do not seem sufficient to separate the specimens into races, especially as we do not know how they stand towards topotypes.

Thomas examined some half dozen examples of the little Siamese bamboo-rat (including the type of *minor*), in connection with series of the other species or races from Burma, etc.,² and professed himself unable to come to any satisfactory conclusion about the former, and for the present we all seem to be in the same position. He notes that all *Cannomys* (red bamboo-rats) "are of similar proportions and all, with one exception (*plumbescens* of the North Shan States) have the coat washed terminally with some shade of rufous which may be brighter in some and deeper in others, but the difference is never beyond the range of individual variation.

¹ Anat. & Zool. Res. pl. XVI. figs. 4, 5, 6.

² Op. cit. pp. 313-7 (1915)

Northern specimens [of *minor*] from Chiengmai and Nan can hardly be distinguished from *C. badius* but they vary considerably among themselves." As no two forms of *Cannomys* seem to occur together it is possible that all are only geographical races of one species.

I have not got Gray's original description of *minor* but Horsfield¹ speaks of the type as "uniformly brown with a slight deep chestnut reflection" though Anderson² says of it and of a Cambodian (?) specimen in the British Museum obtained by Mouhot "dark sooty-brown, slightly tinged with deep umber which is most distinct on the sides of the head and neck and in reflected lights, but is least marked in the Cambodians specimen. The under parts are like the upper only the brown is almost absent." : his coloured plate (XV) agrees with this.

My seven examples, however, which, appear to belong to one form only, though obtained over a fairly wide area, by their colour much more resemble descriptions of the animal accepted as *badius*, also describe and figured by Anderson³, but their skulls resemble the skull from Cambodia (? *lege* Petchaburi, W. Siam⁴) figured by him as *minor*,⁵ and I think it best, therefore, to record all by that name.

Gyldenstolpe bases the name *C. m. lonnbergi* on two specimens from Eastern Siam collected near the locality whence came my two animals; they are notably smaller than the latter—considerably smaller in fact than any example of *Cannomys* yet recorded—and their colour is described as generally "slaty grey with a longitudinal white band down the crown. From the chin down the throat a narrow white line" They were originally recorded as *minor* and it was then said of them that they "seem to be full grown" and later the specimen chosen as the type of *lonnbergi* was said to be adult: One of my series, the sub-adult male from

¹ Cat. Mamm. Mus. East Indian Co., p 165 (1851)

² Op. cit. p. 328

³ Op. cit. p. 329, pl. XIV.

⁴ The only specimen in the British Museum obtained by Mouhot is said by Thomas to have this provenance, and is probably that referred to by Anderson as stated to have come from Cambodia.

⁵ Op. cit., pl. XVI, figs 7, 8, 9.

Lakon Lampang (No 2467) has a white stripe from muzzle to occiput and has rather less brown than other, and more adult, examples.

If one may venture an opinion regarding material one has not examined, I think that Gyldenstolpe's animals may only be immature individuals of the form represented by my Lat Bua Kao specimens; otherwise we have the discovery of two distinct species of *Cannomys* occurring together, whereas the other forms at present known, which each occupy a separate area, seem to me to be only geographical races of *minor* or *badius*—both date from 1842, and I do not know which name is the older.

We are not yet in a position to safely propose new Siamese races of *Cannomys*, for the type (collected by Finlayson) is "immature and much deteriorated" (Thomas), and apparently lacks a skull. Recent workers do not seem to have been cognisant of its exact provenance but it came according to its collector's journal,* from Bamvasor—a place name unknown in Siam in that form. Mr. A. J. Irwin, Adviser to the Royal Siamese Survey Department, informs me, however, that this is undoubtedly a corruption of Bangplasoi, sometimes called Bamplasoi, a district situated in the corner of the Inner Gulf of Siam less than 30 miles east of the Chao Phya river mouth. Finlayson's specimen may well have come thence to Bangkok or Koh Si Chang, places visited by him, for "tun" are appreciated as food by the Siamese peasantry, and are also kept as pets. Of their habits Mr. Irwin says (*in litt.*) "There were no bamboos near where I obtained my three specimens. These animals are very like the English mole in their habits and burrow about in open country leaving regular hills, and are rather unlike the larger bamboo-rat which I have always found at the foot of bamboos where they gnaw away making quite an audible sound, even though they may be some feet under ground. The country-people say that the "tun" feeds on grass-roots, etc. and grubs. There were any amount of them in the district I was in; one was caught in camp within five yards of my tent. Village

* *vide* Horsfield, *loc. cit. sup.* .

children sometimes keep them as pets in jars—they eat their way out of wooden cages, or even out of a kerosine oil tin if there is any rent in it. The “tun” is an inhabitant of “Pa deng” or red jungle, *i.e.*, dry jungle of a somewhat open nature such as bamboo country or very open glades with clumps of trees in districts which are not subject to inundation.”

Measurements of *Cannomys* in millimetres.

Number	2149	2150	2535	2534	2533	2467
Sex and age	♀ ad.	♀ ad	ad.	ad.	ad.	♂ subad
Head and body	207	215	—	—	—	—
Tail	64	59	—	—	—	55*
Hindfoot, s.u.	31	30	30.5*	27*	26*	29*
Ear	13	13	—	—	—	—
Skull and teeth:—						
Greatest length	46.3	46.2	48	—	42.7	—
Condyllo-basilar length ..	43.2	43	44.2	—	38	—
Palatilar length	26.8	26.4	27.1	24	23.7	22
Diastema	17.2	17	17.7	15	15	14
Upper molar series (alveoli)	10.7	10.4	10.8	10.1	9.7	10
“ “ “ (crowns)	9	9	10	9.1	8.9	8.1
Palatal breadth between) anterior roots of <i>m.</i> 2)	3	2.9	3	2.3	2.3	1.9
Nasals	16.5 x 6.2	16.1 x 6.3	17 x 6.5	—	15 x 5.3	13.5 x 4.7
Interorbital breadth ..	9.8	9.2	10	—	8.3	9.2
Zygomatic breadth ..	34	34	35.2	—	31.2	29.3
Auditory breadth	25	25.6	26.3	—	23.4	—
Braincase breadth	19.8	19.4	20.9	—	19	19
Least breadth between) ridges on frontals)	2	1.7	2.1	—	1.3	2.8

* from dried skin.

44 *Lepus siamensis*

Boulhote, P. Z. S. 1902, i, p 40; Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No 2, p. 49, (1917)

2 subad. examples, Chengmai, N. Siam (topotypes). Nos. 2531-2.

1 adult example, Paknambo, Central Siam.¹ No. 2122.

2 ♂ subad., 1 ♀ subad., Lopburi, Central Siam. Nos 2123-5.

1 ♀ ad., Muak Lek, E. Siam between Ayuthia and Korat. No. 2105

1 ♂ subad., 1 ♀ ad., 1 ♀ juv., Koh Lak, S. W. Siam. Nos. 2444-5, 2402

2 ♂ subad., 1 ♀ subad., Mouth of Pran River, S. W. Siam.² Nos. 2536-8.

In colour all these specimens agree closely with Bonhote's description of the type.

Above warm buff and black, the latter nearly absent on the sides and limbs, the shoulders tinged with ochraceous; the hindlimbs ochraceous-buff, the forelimbs and nape nearly ochraceous, all without any black element. Top of muzzle and head ochraceous and black, sides of muzzle to eyes dull whitish. Ears finely grizzled ochraceous-buff and black, the latter in excess; the edges fringed with buffy hairs palest posteriorly; inner side of tips ochraceous-buff, outer side blackish. Tail above pure brownish-black, below white. Sides and front of neck avellaneous-buff, the hairs frequently slightly blackened; fore-chest rather more ochraceous; throat and underparts of body white, this colour extending down the inner sides of the hindlimbs and less distinctly on to the inner sides of the feet.

The dorsal hairs are pale grey at base becoming tinged with buff higher up, next broadly annulated with black, or blackish-brown, and buff and finally tipped with black.

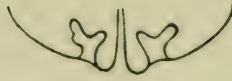
As compared with the type of *peguensis* Blyth (the only one available of that form and unfortunately lacking the posterior portion

¹ Mr. K. G. Gairdner coll.

² Messrs. W. J. F. Williamson & M. A. Smith's collectors.



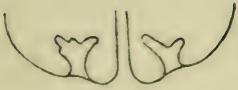
2402



2532



2124



2125



2531



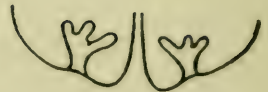
2444



2445



2123



2122



2538



2537



2536



2105

of the zygomata, lower part of the cranium, basioccipital and bullae), skulls are essentially similar, but on the whole the nostrils are less acutely pointed behind; the postorbital processes do not quite touch the cranium posteriorly, though in one example there are indications that contact might occur; the palatal foramina are narrower and the palate bridge broader. The anterior feet of the zygomata are well expanded; the basioccipital is very variable in shape and cannot be relied on for purposes of differentiation.

As regards the teeth the incisor groove in *peguensis* (type) is essentially bifurcate, with the outer branch again forking¹; in the series of *siamensis* the groove is well-filled with cement but is extremely variable otherwise. In the leveret (No. 2402) it is bifurcate, but in older animals the evolution can be clearly traced (Nos. 2532, 2124, 2444, etc.) of the three-branched pattern found in other individuals which is probably typical (Nos. 2445, 2123, 2122). The most eastern and southern specimens exhibit, on the whole, a much more complicated groove than the others, as they have four, and even five, branches (Nos. 2536-8, 2105)

The present series, though it does not come from one place, is undoubtedly of one form only, and serves well to illustrate Forsyth-Major's conclusions²:—"Specimens of the same species may vary slightly owing partly to individual variation. But the shape of the enamel fold varies equally at different stages in the age of the animal; species whose incisors show the most complicated pattern in the adult have as yet no trace of this in very young animals; and *vice versa* in very old specimens complication tends to disappear again. As shown by several of the text-figures, slight variations between the right and left incisor of the same individual also occur."

The incisor groove is a feature that can only be depended on within wide limits for separation of different forms.

Lepus siamensis does not seem to differ markedly from *L. peguensis*, and is distinguished by the absence of any white on

¹ *vide* Records of the Indian Museum, XV., p. 92, fig. 11 (1918).

² Trans. Linn. Soc. VII, Zoology, p. 466. (1899).

the upper surface of the hindfeet and perhaps by the more independent branching of the incisor groove when trifurcate. Mr. T. H. Lyle, who collected the type, tells me that it was perhaps rather immature, an opinion that is borne out by the description of the grooves. He has sent me a series of external measurements (which are given below) and furnishes a curious belief held by the Siamese with regard to this animal: "The peasantry believe that there is no male hare, just as they believe there is no male paddy-bird"—an interesting parallel to the "she" by which the hare is always referred to at home.

Hares are reported to occur in Bangtaphan and Patiyu the next districts southwards of Pran, but no farther down the Malay Peninsula.

Locality.					Sex.	H. & B.	Tail.	H.f.	Ear.	
Nan,	North	Siam	...	...	...	♂	460	55	105	84
"	"	"	...	...	...	♂	484	84	106	87
"	"	"	...	...	...	♂	475	82	101	90
"	"	"	...	...	...	?	440	73	102	87
"	"	"	(immature)		...	♂	470	78	105	86
"	"	"	...	...	...	?	400	77	99	83
"	"	"	...	...	...	?	492	82	110	91
Chiengmoan, west of Nan (2 foetuses)					?	465	77	102	93	
Lampang, North Siam (2 foetuses)					?	440	68	96	86	
Mehongson, west of Chiengmai, N. Siam					♂	428	70	100	84	
Between Bangkok and Paknambo, S. Siam					?	485	77	106	89	

For other measurements see table *postea*.)

45. *Acanthion brachyurus klossi*.

Acanthion klossi, Thomas, Ann. & Mag. Nat. Hist. (8) XVII, p. 136, (1916); Kloss, P.Z.S., 1916, p. 61.

Acanthion brachyurus klossi, Kloss, Journ. N. H. Soc. Siam, III, p. 65, (1918).

A long shot at a porcupine on Koh Mesan only produced some dropped quills; the animal was doubtless an individual of this form, which has a known range from Tenasserim to the border of Cambodia.

* *Bubulcus coromandus*.

UNGULATA.

46. *Bos gaurus readi*.

Bos gaurus readi, Lydekker, Zoologist, ser 4, VII, p. 266 (1903);
id, Game Animals of India, etc., p. 60-62, fig 5 (1907).

A pair of detached horns, exact locality unknown.

Though short (length along outer curve $23\frac{1}{4}$ inches) these horns are very massive for their length having a basal girth of 17 inches.

Mr. K. G. Gairdner (in Journ. N. H. Soc. I. p. 113 and plate) gives measurements of some Siamese heads and figures two pairs which show what very different forms the horns of this species may take: Gyldenstolpe (Kungl. Sv. Vet. Akad. Handl. 57, No 2, p. 57, pl. 1, fig 3) figures as *B. g. readi* a very extraordinary trophy from Prachuap Kirikan, S. W. Siam, with the bases of the horns much swollen and rugose and nearly touching on the intercornual ridge: it is, however, in several ways more suggestive of a banteng than of a gaur.

Practically all Siamese specimens have been obtained in the north or west.

(I am indebted to Mr. W. E. Trotter for these horns and four pairs of the *Cervus* antlers mentioned below)

47. *Capricornis sumatraensis annectens*, subsp. n.

Intermediate between *C. s. sumatraensis* and *C. s. milne-edwardsi* of Szechuan. Differs from the first in having the lower parts of the limbs largely rufous, and from the latter in having the rufous colour not extending above the knees and hocks.

General colour black but the bases of the hairs on back and sides of body largely white, giving a grizzled appearance to the pelage. Mane very variable in size and colour but white basally; anteriorly the hairs nearly always largely black; posteriorly the distal portion of the hairs variable, black or chocolate or pale drab: sometimes with a few entirely dark hairs intermixed. Tail with a few rufous or albescent hairs.

Outer surface of ears with many rufous hairs basally, inner surfaces white. Extremity of muzzle and the lips white; a large

rufous and white throat patch, broadest posteriorly, continuous with the white of the lips and with it surrounding a black chin-patch.

Limbs black or blackish brown to the knees and hocks, below which they are variable in colour; a considerable amount of rufous present, and always the back of pasterns and the hair surrounding the upper digits rufous; sometimes the shanks are completely rufous, sometimes rufous in patches, and sometimes mingled rufous and black.

1 ♂ imm., 1 ♀ juv. Koh Lak, S. W. Siam. 11th Nov., 1916. Nos. 2413,4/CBK. Other specimens:—an example from Koh Lak shot by Mr. T. S. Butler (*vide* Irwin, Journ. Nat. Hist. Soc. Siam, I, p. 21); a female from near Si-sa-wad, Quaa Yai River, Western Siam, shot by Mr. K. G. Gairdner (*vide* Gairdner, *ibid*, p. 254). Both in the British Museum.

The typical locality may be taken as Kok Lak though this is probably nearly the extreme southern limit of the range. The form apparently extends north to meet *C. s. milne-edwardsi*, at least as far as the Shan States, and it also seems to inhabit Pegu.

I deliberately refrain from selecting a type in this instance, as my experience of serows is that they exhibit so considerable an amount of individual variation that a single example may give a false idea of the characters of a race. As I am going into the subject of Siamese and Malayan serows at some length in a paper for this Journal, I shall not deal with the present form in further detail here; the variation, however, is probably greater than suggested above.

I am by no means certain that the various recognised serows are all subspecies of *sumatraensis*, but I prefer to regard them as such at present, and to consider that the inoculation which to some extent occurs, is due to irregular gradation caused by individual variation, and also perhaps to wandering habits. Serows are not lowland animals, and when they leave a hill for the plains, as they sometimes do, and not return to it, it may be necessary for them to travel considerable distances before they find another suitable home. This may be the explanation of

overlapping in certain places, such as the Koh Lak Peaks, where the present form occurs in association with animals in which the lower legs are almost entirely black.

My specimens were shot on the rugged limestone hill which forms the southern extremity of Koh Lak Bay. Near it are some limestone islets, one of which about a hundred yards to seaward is connected with the mainland hill by a reef almost dry at low tide; it was on this that Mr Butler obtained his specimen, but it is well known locally that the serows swim to and fro between mainland and islands.

48. *Cervus unicolor equinus* Cuv.

Cervus unicolor subsp, Kloss, P. Z. S. 1916, p. 62.

Cervus unicolor equinus, Kloss, Journ. N. H. Soc. Siam, II, p. 28 (1916).

Two pairs of antlers, exact locality unknown.

Indistinguishable from Sumatran and Malayan examples with the inner hinder tine of the terminal fork much shorter than the anterior outer one.

The measurements and figure of a particularly fine pair of Siamese antlers are given by Mr. K. G. Gairdner in the Journal of the Natural History Society of Siam, Vol. I, p. 117 and plate (1914).

49. *Cervus eldi siamensis**

(PLATE 8).

Cervus eldi siamensis, Lydekker, Cat. Ung. Brit. Mus., IV, p. 104 (1915)

Panolia platyceros, Gray, List Mamm. Brit. Mus. p. 181 (1843); Blyth, P. Z. S. 1867, p. 842, text figs 20-23, p. 841.

Cervus eldi platyceros, Auct., Gairdner, Journ. Nat. Hist. Soc. Siam, I, p. 113 (1914).

Three pairs of antlers, exact locality unknown.

Two of the specimens are of normal size but the third pair, which I purchased in Bangkok, is an unusually fine example not only in length but in massiveness also. Greatest dimensions are:—

Length of outer curve (exclusive of the brow tine)	36 inches.
" " brow tine along lower side	13½ "

* If this deer is regarded as belonging to a genus distinct from *Cervus*, i. e., *Rucervus*, it should then be called *Rucervus eldi platyceros* (Gray).

Length along outer curve of main antler and brow tine combined	50 inches.
Tip to tip of antlers	23 "
Maximum width inside antlers	24½ "
Circumference below the brow tine	8¼ "
" above brow tine	7½ "
" near mid-beam (least)	5¾ "
" above the first spike	6¾ "

The appearance of the horns is spoilt by asymmetry; there are five points on one beam and six on the other, while one brow tine has two spikes, the other only one (see plate).

Approximate weight exclusive of bone, 9 lbs.

50. *Muntaicus muntjak* subsp.

Muntaicus muntjac currostylis, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 54 (1917).

1 ♂ ad. Koh Lak

1 ♂ imm. Koh Mesan off Cape Liant.

These animals are very different from the dull-coloured barking-deer of Tenasserim, *M. m. grandicornis* Lydekker, as represented by examples from Victoria Point. They most nearly resemble specimens of *M. m. peninsulae* Lydekker, from Perak, Malay States, which is a brightly coloured form (typical locality, Pangkor Id, Dindings).

Compared with the latter the apparent differences are:—in the Siamese examples the sides of the face, forehead, occiput and pellicels are much paler (more buffy, less rufous); the neck and shoulders are more ochraceous (less tinged with brown), and the median dorsal line not quite so deep a shade of rufous and not black-speckled; the lower parts of the hindlegs are a little darker in front and the feet are also darker, while the underbody is more fulvous and less tinged with brown. Whitish patches above the hoofs, a feature of common occurrence, are exhibited by both specimens.

To Siamese antlers from Petchabun, Central Siam, the name *currostylis* was given by Gray; but material in collections is so scanty and imperfect that we do not know what the characters of typical animals are.



BROW-ANTLERED DEER OR LAMANG.
(*Cervus eldi siamensis*, Lydekker).

I have the skull and skin (without limbs or tail) of an immature female obtained by Messrs. Elwes and Yates in the Me Wang Forest about 100 miles west of Petchabun, which geographically more nearly represents a topotype than anything else on record. It is slightly less bright than my specimens (thus seemingly approximating to *grandicornis*, type locality Amherst) and has the tips of the ears broadly white externally, whereas the others have only the borders of the ears white. All three animals have the inside of the ears pure white with no sign of a tawny patch at the lower edge. I propose to leave them under the specific name until better material representing *curvostylis* has been obtained.

I was told by the Siamese crew of my boat, who knew the district well, that the Koh Mesan "*i keng*" is a much smaller animal than that of the mainland.

Measurements of the Koh Lak¹ and Koh Mesan² animals respectively:—head and body, 940, 940; tail, 175, 170; hind foot, s. u., 285, 290; ear, 97, 98; height at shoulder, 575, 550. Skull: greatest length, 200, 184; greatest breadth, 90, 70; length of pedicel from base on inner side 88 (116 to tip of horn in the latter).

51. *Tragulus kanchil affinis*.

Tragulus affinis, Gray, P. Z. S. 1861, p. 138.

Tragulus kanchil affinis, Kloss, P. Z. S. 1916, p. 63; id. Journ. Nat. Hist. Soc. Siam, II, p. 86 (1916).

1 ♂ imm. 1 ♀ ad. Lat Bua Kao.

Two very typical examples with faintly indicated nuchal stripes of the same colour as the crown.

Measurements of the adult:—External dimensions taken in the flesh:—head and body, 450; tail 80, hindfoot, c.u., 115; ear, 37. Skull:—greatest length, 95; condylo-basal length, 87; basal length, 80; palatal length, 59; upper tooth row (alveoli), 32.5, crowns, 33; crowns of premolars only, 16; greatest length of nasals, 29; greatest breadth of combined nasals, 12.8; least interorbital breadth, 26.6; zygomatic breadth, 42.5; external biorbital breadth, 45.6.

1. Weight 60 lbs.

2. Horns not yet differentiated from the pedicels.

My *T. k. williamsoni* from North Siam¹ is not only larger but has the upper parts less blackened and of a deeper, more tawny, colour with paler, narrower throat markings; the palatal extension is shorter and broader, but the external biorbital breadth is about the same. *T. k. angustiae*² from S. Tenasserim and S. W. Siam is rather more brightly coloured and has the nuchal stripe dark and distinct.

EDENTATA.

52. *Manis javanica*.

Manis javanica, Desm., Mamm. p. 377 (1822); Kloss, Journ. N. H. Soc. Siam, 111, p. 65 (1918).

1 subad., Lat Bua Kao.

Longitudinal rows of scales round the body, 17; total number of scales in the longitudinal median line, 61; number of scales in the upper median line of tail only, 29.

Head and body, 480; tail, 380; hindfoot, 80 mm. Skull:—greatest length, 90; basal length, 86; greatest breadth, 35.7 mm.

AN ALTERNATIVE NAME FOR *PRESBYTIS GERMAINI MANDIBULARIS*.

For the benefit of those who follow Mr. Oldfield Thomas in the use of *Pithecus* as the generic name for the langurs or leaf-monkeys, I name the animal of Koh Chang S. E. Siam, *Pithecus germaini changensis* as well as *Presbytis germaini mandibularis*, under which its description will be found in P. Z. S., 1916, p. 32. The combination *Pithecus mandibularis* is preoccupied, having been applied by Elliot to a macaque from Western Borneo (Proc. U. S. Nat. Mus., 38, 1910, p. 347); as, therefore, whenever the Koh Chang leaf-monkey is placed in *Pithecus* it will be without a name, I provide it with one as above.

C. BODEN KLOSS.

¹ Journ. Nat. Hist. Soc. Siam, 11, p. 88 (1916).

² Kloss, Journ. Fed. Malay States Mus., VII, p. 254 (1918).

Measurements of *Tupaia* spp. from Siam.

Species and Locality	Sex	Head and body	Tail	Hind-foot, s. n.	Ear	SKULL							No.	Remarks
						Greatest length	Basal length	Palatal length	Upper molar row (alveoli)	Tip of premax to hyachy- mal notch	Rostral breadth at diastema	Inter- orbital breadth		
<i>Tupaia glis betangeri</i>														
Koh Lak, S. W. Siam.	♀	172	165	40.5	15	47	40.9	24.1	15	19	6.3	14.4	25	2399 Adult
" "	♂	172	183	42.5	14.5	50	44	26	15.2	20	7.1	14.6	25.8	2403 " "
" "	♀	177	181	41	16	48.4	42.6	25.3	15.3	19.2	6.1	13.5	24.6	2415 " "
" "	♀	175	185	39.5	16	49	42.3	25.7	15	19.1	6.1	14.2	25.1	2418 " "
" "	♂	180	167	38	15.5	47	41.8	24.8	15	19	6	13.3	25	2427 " "
" "	♂	188	182	42	15	48	42.3	25.2	15.1	19	6.2	14.2	25	2428 Sub-ad.
" "	♂	187	171	40	15.5	48.4	42.5	26.5	15	19.1	7	14	25.3	2429 " "
Satubip, near Cape Liant, S. E. Siam	♀	193	182	42	17	50.3	43.3	26	15.2	19.3	7	15.5	25.5	2376 Adult
" "	♂	180	175	39.5	16.5	48	41.4	28.4	14.6	18	7	13.1	25.2	2153 " "
" "	♀	176	177	42	15	49	43	26	14.5	20	6.2	14.1	25	2160 " "
" "	♂	193	187	42	15	50.3	43.5	25.7	15	20	6.9	15.1	26.1	2172 " "
" "	♂	192	173	41	16	50	43.1	25.5	14.5	18.9	6.9	14.2	25.8	2190 " "
" "	♂	180	170	38.5	15	47.6	40.1	24	14.6	18	6	14	24.6	2154 " "
<i>Tupaia glis olivacea</i>														
Pak Bu, Tachin, Central Siam	♂	223	196	44	—	52.3	45.7	28	14.7	21.2	8	14	27.6	2207 Adult
" "	♂	195	198	41	—	52.2	45.2	28	14.5	20.8	7.6	14.9	27	2208 " Type.
" "	♀	188	185	43	16	50.7	—	27	14	20.6	7.6	14.7	27	2205 " "
" "	♀	178	185	41	16	51.4	44.9	28.1	14	20.5	7	14.9	—	2206 " "

Measurements of *Pteropus* spp. from Siam.

<i>P. w. malaccensis</i>													<i>P. lylei</i>
	2314	2338	2342	2316	2339	2341	2340	2319	2315	2351	2343	2417	2451
Number	..	..	..	..	..	..	..	..	..	..	..	..	..
Sex and age	♂ ad.	♂ ad.	ad.	♀ ad.	♂ ad.	♀ ad.	♂ ad.	♀ ad.	♀ ad.	♀ ad.	ad.	♂ ad.	♀ ad.
Head and body	322	296	—	292	295	295	295	293	312	205	—	248	225
Forelimb	198	193	—	200	202	207	192	203	209	205	—	147	138
Wing from carpal	38	41	—	44	40	40	44	40	43	42	—	35	35
Lower leg	96	92	—	94	98	91	98	95	103	97	—	69	65
Hand-foot, s-m	55	55	—	59	61	56	52.5	56	60	57	—	45	42
Skull and teeth:													
Sagittal crest	heavy	heavy	heavy	heavy	medium	medium	medium	medium	medium	slight	slight	nil.	nil.
Total length to gnathion	80	79	78	79	75.5	74	77	77	81.2	77	80	62	61
Pelation to incisive foramina	38.5	38.3	38	39	36.6	36.3	37.5	37	40.8	37.7	38.5	30	29
Front of orbit to tip of nasals	26	25.2	26.6	26.2	24.2	25.8	25	24.2	28.5	26	26.4	20	19.6
Width of braincase at zygomatic	27.8	26	26.5	26.8	27.6	26	26.1	26.1	26.8	27	27	24.2	22.6
Zygomatic width	45	41.8	41	38.3	40	37.2	40	42.2	42	44	42	37.5	34
Width across ear externally	22	20	22	20.8	19.9	19.5	20	21	21.2	21	21.5	16.9	17.5
Postorbital constriction	9	8	9	10.1	10	8.2	9.2	8.5	10.3	12	10	10.1	8.3
Intraorbital constriction	11	10	11	11	10.2	10	10.5	10.5	11	12	10.2	9.5	8.6
Width of mesopterygoid fossa	9.2	8.1	8.4	8.5	8.1	8	7.5	8	8.8	9	9.2	8	7.7
Between p ³ -p ⁴ internally	12.1	10.6	12	11.5	11	10.5	10.7	10.3	11.3	12	12.1	10.1	9.9
Between cingula of canines	9	7.6	8	7.5	6.8	6.5	7	7.3	7.9	8.3	7.9	7	6.9
Orbital diameter	16.8	16.5	16.3	17.1	15.2	16.8	15.6	16.2	16.9	16	16.5	13.8	13
Mandible, length	63	61.2	60	62.2	60.2	59.2	60.6	61	64	60.2	62.2	48.1	49
Upper teeth, c-m ²	30	29.1	28.4	29.4	28	28	28.4	30.3	29.2	30.7	30.2	21.4	21
Lower teeth, c-m ³	29.7	30	28.8	30	28.8	29	28.8	30	31	30	29	23.7	22.9
	31.8	33.5	32.8	36	31.6	32.8	33.8	33	34	32.8	34	26	25.6

FOUR: 31, 11, 1, 700, 21 AM.

Measurements of *Sciurus* spp. from Siam.

Species and Locality	Sex	Head and body	Tail	Hind foot, s. n.	Ear	SKULL								No.	Remarks
						Greatest length	Condylar length	Palatilar length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter-orbital breadth	Zygomatic breadth		
<i>Sciurus caniceps caniceps</i>															
Lat Bua Kao, E. Siam	♂	248	267	55	23	58.2	50	25	13.8	11	16.7	20.9	33.3	2145	Adult
<i>Sciurus caniceps incinctatus</i>															
Koh Lak, S. W. Siam	♀	200	220	46.5	18.5	55.5	46.2	23	12.3	11	17	20	32.8	2390	"
"	♀	223	207	45	20.5	—	—	—	—	—	—	—	—	2391	"
"	♀	220	215	47	20	54	45.2	21.8	11.5	10.7	15.1	20	32	2398	"
"	♀	220	215	48.5	19.5	53.5	45.3	22.3	12.2	10.1	15.4	18.3	30	2421	"
"	♀	194	—	47	19.5	55	46	22.8	12.4	10.5	17.5	18.3	30.7	2434	" Type
<i>Sciurus atrodorsalis pranis</i>															
Koh Lak, S. W. Siam	♀	205	202	47	20	52	43.3	20	11.3	9.8	13.7	18	30	2393	"
"	♀	211	200	47	21	51.7	43.7	20.8	12	9.7	14.1	17.5	30.4	2394	"
"	♂	208	193	49	19.5	51.9	44	21.5	12	10	16.6	18.7	29	2395	" Type
"	♀	208	197	48	21	51	42.9	20.5	11.5	10	14.6	18.1	30	2401	"
"	♀	217	218	50	21	52	44	21	11.6	10	16	18	30	2405	"
"	♂	205	200	47.5	21	51.5	43.2	20.5	11.6	9.2	15	18	29.8	2424	"
"	♂	203	203	48	20	50	42	21	11	10	13.8	18.7	30	2425	"
"	♀	215	—	50	18.5	52.4	44	21.3	12.3	9.8	14	18.3	30	2426	"

Measurements of *Sciurus* spp. (continued).

Species and Locality	Sex	Head and body	Tail	Hind foot, s. u.	Ear	SKULL								No.	Remarks
						Greatest length	Condylar length	Palatine length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter-orbital breadth	Zygomatic breadth		
<i>Sciurus atrodorsalis tachin</i>															
Tachin, Central Siam	♂	175	155	43	18	44.5	38.4	18.8	10.6	8.5	12.2	15.8	27.2	2113	Adult
"	♂	177	163	43	18	46	37	17.4	10.2	8.3	11	16.1	27.6	2200	"
"	♂	179	165	40	—	45	37.3	18.3	10	9	12.2	16	27.2	2210	"
"	♀	160	166	38	—	44	36.3	17.5	9.6	8.1	11.1	15.5	27.6	2212	"
"	—	206	—	42	—	46	38	18.2	10	8.8	13.1	16.2	27.7	2213	Type
"	♂	188	145	41	—	45	37.8	18	10.4	8	12.8	16	26.4	2214	"
"	♂	202	151	39	—	44	36.8	18	10	8.2	11.2	15	26	2215	"
"	♀	180	160	42.5	17	44.2	36.8	18.1	10.1	8.5	11	16	27	2219	"
<i>Sciurus nox</i>															
Satulip, near Cape Liant, S. E. Siam.															
"	♂	222	228	51	23	54.2	46.2	23	13	10	16.5	19	32	2383	"
"	♂	240	250	54	21.5	56.3	48	23.6	12.6	10.2	17.2	20.3	32.3	2372	"
"	♂	220	235	50.5	22	56	47	23.1	13	9.7	16.4	19	32	2374	"
"	♂	228	235	53	21.5	55	46	22.7	13.1	9.5	16.7	20	31.6	2375	Aged
"	♂	237	230	53	22.5	55	46.3	22.6	12.1	10	16.3	19	32.3	2380	"
"	♂	223	227	54	22	55.2	46.8	23	12.2	10.7	17.1	18.9	32	2382	Adult
"	♂	225	225	51	21.5	54	45.8	22.4	12.6	10	14	19	32.1	2383	Aged
"	♂	225	225	53.5	22	54.5	46.2	23	13	10	17.2	19	31.2	2384	Adult
"	♂	220	225	51	21.5	54.3	46	22	12	10.2	16.5	20	32	2385	Aged

Measurements of *Sciurus* spp. (continued).

Species and Locality	Sex	Head and body	Tail	Hind foot, s. u.	Ear	SKULL							No.	Remarks	
						Greatest length	Condylar length	Palatilar length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter-orbital breadth			Zygomatic breadth
<i>Sciurus phillysoni tachardi</i>															
Lat Bui Kao, E. Siam.	♀	240	220	51	19.5	55.5	47	23	12.7	11	17.2	20	33.2	2132	Adult
"	♂	241	224	54	22	57	48.8	23	13	10.3	17	21.3	35	2135	"
"	♀	240	250	52	20	56.7	48	23	12.2	11	16	19.2	32	2140	Aged
"	♂	230	227	51	20	55	46	23	12.8	10	17	19.8	32.3	2141	Adult
"	♀	240	220	53	21	56	47	23	12.8	10.6	17	19.3	32.7	2143	"
"	♀	235	245	55	22.5	56.2	47	23	12	10.2	16.1	21	32.2	2146	Aged
"	♀	230	215	53.5	20	56	46.2	22.2	12	10.4	17	19.5	32.1	2165	Adult
"	♂	233	230	54	22	56	47	22.6	12.8	10.3	17	20.2	33.3	2173	Aged
"	♀	210	230	51.5	20.5	54.4	46	22.1	12.1	10.2	16.4	20	32	2185	Adult
<i>Sciurus phillysoni trotteri</i>															
Koh Lan Id., Inner Gulf of Siam	♀	193	177	43.5	18.8	48	40	19.8	10.1	9.	14	17.6	29	2244	Adult
"	♀	186	174	42.5	18	47.5	40.3	19.1	10.5	8.8	14.1	—	28	2248	"
"	♂	185	160	43	17	47	38.3	19	10.1	8.6	13	16.4	27.2	2250	"
"	♀	190	170	44.5	17.5	47	39.5	19.2	10.1	9	12.8	17	28	2251	"
"	♀	190	165	43	18	47	39.3	19.3	10.2	8.9	13.1	17.6	28.6	2255	"
"	♀	185	180	43	17	47.1	39.7	19.5	10	9	14	17	28.1	2256	"
"	♂	188	172	44	18	47.3	40	19.6	10.1	9	13.4	17.1	27.8	2266	"
"	♀	174	166	44	18	47	38.9	19.2	10.6	8.9	12.8	16	27.4	2272	"

Measurements of *Macetes* subsp. from Siam.

Species and Locality	Sex	Head and body	Tail	Hind foot, s. u.	Ear	SKULL							No.	Remarks
						(least length	Condylar length	Palatine length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter- orbital breadth	Zygomatic breadth	
Hua Hin, Phan, S.W. Siam.	♂	175	67	41	16	47	40.5	22	12	10	13.6	—	25	2510 Adult
"	♀	185	140	39	17	48	41.5	23.2	12.8	10	15.2	13	26	2541 "
<i>Macetes bedfordi bedfordensis</i>														
Lat Bua Kao, E. Siam	♀	190	80	41	18.5	50	43	22.8	13.2	9.4	14.2	12.6	26.8	2147 "
"	♀	188	145	39	20	47.2	41.5	22	12.6	10	15	11.4	26	2503 Adult
Pak Jong	♀	—	—	—	—	49.5	42	23.6	13.1	10	15	13.2	26.6	2108 Subad.
Sakong, S. E. Siam	♂	193	102	42	19	—	—	24.1	14	10	14	—	—	2365 "
"	♀	191	121	41	20	49.4	42.5	22.6	12.9	9.8	13.2	13.1	27.2	2378 "
<i>Macetes bedfordi bedfordensis</i>														
Me Taw, Reheng, W. Siam, 1500 ft.	♀	179	160	40.5	20	—	42.2	23.2	12	10	13.4	11.8	26	2648 Adult
"	♂	180	140	41	20	49.5	42.4	22.1	12	9.9	13.8	11.4	25.5	2649 "
"	♀	192	118	40	19.5	50.4	44.1	23.2	13.1	10.1	14	12.1	26.5	2650 "

Measurements of *Menetes* subsp. (continued).

Species and Locality	Sex	Head and body	Tail	Hind foot, s. n.	Ear	SKULL								No.	Remarks
						(greatest length)	Condylar length	Palatilar length	Diastema	Upper molar row (alveoli)	Median nasal length	Interorbital breadth	Zygomatic breadth		
<i>Menetes berdmorei</i>															
<i>petasulavici</i>															
Ban Kok Klap, Nakhon Si Thammarat, Peninsular Siam	♂	195	142	41.5	19.5	48	40.5	22	12	9.9	12.3	13.1	26	101/13	Adult
"	♀	192	133	40.5	19	48.3	41.2	23	13	9.1	14	12.2	26.4	102/13	"
"	♀	193	148	41	20.5	49	41.7	23	12.1	10.1	13.8	12.6	25.2	105/13	"
"	♀	195	137	41	19	50	42	22	12	10.4	14.1	12.7	27	106/13	" Type
"	♀	196	149	43	20	50	42	23	12.4	10.2	14	12.5	26	109/13	"
"	♀	199	135	41	17.5	50	42	23	13.2	9.6	14.1	12.2	27	113/13	"

Measurements of *Rattus* spp. from Siam.

Species and Locality	Sex	Head and body	Tail	Hind foot, S. u.	Ear	SKULL							No.	Remarks
						Crest length	Condylar breadth	Basilar breadth	Upper molar row (alveoli)	Length palatal foramina	Median nasal length	Breadth combined teeth	Zygomatic breadth	
<i>Rattus sordidus</i> (Bodder?) Lat Hua Kao, E. Siam	♂	224	328	45	29	53	43	12.6	9.1	7.9	20.2	5.7	23.4	2176 Adult
<i>Rattus sordidus</i> Koh Lak, S. W. Siam	♂	203	212	38	25	47.7	39.5	12.9	6.8	6.8	18.5	6	22	2116 "
<i>Rattus sordidus</i> Satulhip, near Cape Lant, S. W. Siam	♂	204	208	39	25	47.5	39.7	13.1	7	7	19	5.2	21	2367 Adult
"	♀	189	195	37	24.5	45.4	38.1	12	6.8	6	17.5	5	19.2	2268 "
"	♀	192	183	36	24	46.1	39.1	13.1	6.6	6.6	18	5.1	20.7	2370 "
"	♀	180	185	35	25.5	45	37.4	12.1	6.8	6	18	5.2	20	2371 "
"	♀	188	202	37	26	47	39	13.6	6.4	6.4	19.2	6	21.2	2377 Aged
"	♀	214	221	40	27	50	42.1	11	7.1	7.1	20	5.4	22	2387 Adult
<i>Rattus sordidus</i> Lat Hua Kao, E. Siam	♂	181	166	35	25.5	44.8	36.7	12.1	6.9	7	17	5.1	20.2	2167 Adult
"	♀	187	192	36	25	45.1	37.7	12.3	6.9	6.8	18	5	20.2	2175 "
"	♀	192	208	39	27	47.3	40	13	7.1	6.8	18.2	5.1	21.2	2179 "
"	♀	193	193	38	25	46.4	39.5	13.1	7	7	18.7	5	20.1	2180 " Type
"	♀	180	182	38	25	43.8	36.6	11.4	6.8	6.6	17	5.1	19.2	2187 "
"	♀	171	178	34	22.5	44.7	36.6	11.2	6.9	6	18.6	5	19	2191 "

Measurements of *Rattus* spp. (continued).

Species and Locality	Sex	Head and body	Tail	Hind foot, s. u.	Ear	SKULL								No.	Remarks
						(cheek length)	Condylar length	Distenna	Upper molar row (alveoli)	Length palatal foramina	Median naoal length	Breadth combined nasals	Zygomatic breadth		
<i>Rattus rajah kramis</i>															
Koh Krau, Inner Gulf of Siam	♂	173	187	37.5	25	44.5	36.7	12.1	6.8	5.9	17.3	5.1	19.4	2277	Adult, Type
"	♂	172	185	38	24.5	45.4	37.8	12.9	7	6.4	18.3	5.1	21	2278	"
"	♂	179	187	38	26	45.2	37.2	12.5	7	6	17.8	5.1	20.7	2279	"
"	♀	170	165	36.5	24	42	35.2	11.6	6.9	6.2	16.3	5	19.8	2280	"
"	♀	176	184	36.5	25	44	36.5	12.4	6.4	6	17.6	5.1	20	2296	"
"	♀	167	161	34	23	42.7	35.5	11.8	6.8	5.8	16.6	5	19.6	2297	"
<i>Rattus rattus neglectus</i>															
Tachin, Central Siam	♂	180	194	35	25	41.1	36.3	11.3	6.9	8	15	4	18.9	2220	Adult
"	♀	179	207	35	24	41	35.2	11.2	6.8	8.1	15.1	4.5	19.4	2221	"
"	♀	190	171	33	25	39.8	34.9	11	6.3	7.7	14.1	4.1	18.2	2222	"
"	♂	186	196	34	23	41.2	36.9	11.1	6.8	8.2	14.6	4.5	19.2	2224	"
"	♂	171	191	35	22	42.2	37.7	11.9	7	8	15	5	19.2	2225	"
" Koh Lak, S. W. Siam	♀	170	201	32	21.5	41.1	36	10.7	6.8	7.7	15.1	4.3	20.2	2417	"
"	♂	168	202	35	23	44	38.5	12.1	7.1	8	17.8	5	21	2442	"

Measurements of *Rattus* spp. (continued).

Species and Locality	Sex	Head and body	Tail	Hind foot, mm.	Ear	SKULL										No.	Remarks
						Cranio-basilar length	Diastema	Upper molar row (alveoli)	Length palatal foramina	Median nasal length	Breadth combined nasals	Zygo-basilar length					
<i>Rattus rattus lanceus</i>																	
Koh Lan, Inner Gulf of Siam	♂	176	195	37	23	40	35.1	10.2	7.9	8	14.2	4.5	18.9	2227	Subad.		
" "	♂	166	185	35	22	39	33.5	10	7.3	7.5	14.1	4	18.4	2230	"		
" "	♂	190	200	35	24	43.6	38.1	12	8	8.8	16.2	4.8	20.8	2261	Adult. Type		
" "	♀	205	175	35	22	41	36	11.4	7	8	15.6	4.7	19.6	2273	"		
" "	♀	157	183	34	21.5	40.8	35	10.3	7.1	8	13.8	4.1	18	2274	Subad.		
<i>Rattus rattus bramensis</i>																	
Koh Kram, Inner Gulf of Siam	♂	181	201	34.5	22.5	41.7	36.1	11	7.1	7.2	15	4.8	20.5	2276	Adult		
" "	♀	186	216	34.5	23	42.1	37.8	11.8	7	7.1	15.2	4.9	21	2281	" Type		
" "	♂	188	200	36	23	41.1	36	10.7	7.6	7.2	15	4.9	20.4	2292	"		
" "	♀	180	230	34	23	41.8	37	11.4	6.9	7.6	15.2	4.4	20	2293	"		
" "	♀	180		34	22	41	37.8	11.9	6.8	7.8	16	4.9	20.2	2298	"		
<i>Rattus rattus mesas</i>																	
Koh Mesan, Inner Gulf of Siam	♂	194	218	37	23.5	45.2	40	13	7.1	9	17.8	5	20.1	2303	"		
" "	♀	197	228	37	24	46	39.5	12.2	7.8	8.6	17.1	5	21.5	2304	"		
" "	♀	195	215	35	23.5	45	38.3	12.4	7.1	8.9	16.9	5	20	2306	"		
" "	♂	196	224	38	25	45.2	40	13	7	9	15.7	4.9	20.9	2320	" Type		
" "	♂	200	225	38	24	44.1	39.3	11.8	7.8	8.5	15.2	5	21	2321	"		
" "	♀	205	228	38	25	44.8	39	11.8	8.0	8.3	16.2	5	21.1	2323	"		
" "	♀	196	215	37	23	43.8	38.5	12.1	7.2	8.9	15.5	5	20.9	2325	"		
<i>Rattus rattus lanceus</i>																	
Lat Bua Kao, E. Siam	♂	167	210	32	21.5	41.7	35.4	11	7.1	8	15.5	5.1	21	2196	Adult. Type		

Measurements of *Lepus siamensis*.

No.	..	2531	2532	2122	2123	2124	2125	2105	2444	2445	2536	2537	2538
Sex.	..	..	..	..	..	..	..	..	..	..	..	..	..
Age	..	..	..	..	..	..	..	..	..	..	..	..	..
Head and Body	..	..	..	..	..	..	..	..	..	..	..	..	..
Tail	..	..	..	..	..	..	..	..	..	..	..	..	..
Hind foot, s. u. ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ear	..	..	..	..	..	..	..	..	..	..	..	..	..
<i>Skull and teeth:</i>													
Length, front of pmx to occiput	..	84	85	98	84.3	87	85	90	93	87	88.5	91	87
Basilar length (from back of large incisor).	..	64.5	65.7	73.3	66	67.8	65	71	71.2	68	69	70.7	67.2
Diastema	..	23	24.2	26.4	25	26.3	23.9	27	26	25	26.5	26	25
Upper molar row (alveoli).	..	14.7	15.5	18	15.3	15	15.6	16.3	17	15.8	16	16.3	15.9
Least breadth of palate bridge.	..	6.7	6.9	8.2	7.8	7.3	7.1	7.1	9	6.1	7.1	8.5	6.3
Least breadth of mesopterygoid space.	..	6.7	6.9	7.5	6.1	6.1	6	7.1	6.1	5.9	5.9	7.2	7
Diagonal length of nasals.	..	36	36.8	45	38	39	37.6	45.3	42.7	36.6	39	39	39
Anterior frontal constriction.	..	17.4	16.2	20	16.4	15.6	18	19.3	18.3	16.9	18.5	19	17.6
Posterior	..	13	13.1	13.7	14.1	14	15	13	14	12	13	13.5	11.8
Zygomatic breadth posteriorly.	..	41	40	42.7	37.2	38	38.2	40.6	41	39	39	40.2	39.4
do. do. across anterior processes...	..	40	39	43.2	40	40	41.5	42.2	43	40.3	41.7	43.2	40.8

* Hares called adult are those in which the frontal suture is obliterated.

EXPLANATION OF PLATE 9.

Dorsal and lateral views of *Anotogaster klossi*, (Nat. size.)

I and 2. Frontal and lateral views of head.

A and B. Trigones of the fore and hind-wings showing neuration.



NOTES ON A COLLECTION OF BIRD-SKINS
FORMED BY MR. E. G. HERBERT, C.M.Z.S., M.B.O.U.

(continued from p. 216).

109. PRATINCOLA TORQUATA PRZWALSKII.

Pratincola maura, var. *Przewalskii*, Pleske, Wiss. Res. Przewalskii, Rieser, Vogel, 1, p. 46 (1889).

♂ juv., ♂, 2 ♀ Krabin, C. Siam, 14-17.11.15.

♂ Maprit, P. Siam, 1.1.16.

2 ♂ ♀ Samkok, C. Siam, 14-17.3.16.

I place these birds provisionally under this name, but their position is very doubtful, as is often the case with many migrant specimens of *Pratincola*. They are typically large birds, the males having wings over 72 mm. and the females between 67 and 69 mm. This is an extremely common breeding bird over the whole of the Himalayas and northern Burmese hills, and from the huge mass of material in the British Museum of migratory birds in India, Burma and China it is easy to pick out series which would agree with any one of the three forms supposed to come within these limits. In spite of their large size, the white on the sides of the neck and on the breast is very extensive, and the under parts seem very pale when compared with typical *przewalskii*.

110. HYDROCICHLA FRONTALIS.

Enicurus frontalis, Blyth, J. A. S. B. xvi, p. 156 (1847).

♂ ♀ Tung Song, P. Siam, 12.9.15.

111. HYDROCICHLA RUFICAPILLA.

Enicurus ruficapillus, Temm. Pl. Col. iii, pl. 534 (1832).

♂ juv. ♀ Tung Song, P. Siam, 16-18.9.15.

The young male is like an adult female, and shews no signs of spots or of having been spotted.

112. LARVIVORA CYANEA.

Motacilla cyanea, Pall. Reis. Russ. Reichs. iii, p. 637 (1776).

♂ Klong Wang Hip, P. Siam, 3.10.15.

♀ Krabin, C. Siam, 5.11.15.

♀ Maprit, P. Siam, 30.12.15.

♂ ♀ Klong Bang Lai, P. Siam, 16-18.1.16.

113. CITTOCINCLA MACROURA MACROURA.

Turdus macrourus, Gmel. S.N. i, p. 820 (1788).

♂ Hup Bon, S. E. Siam, 21.7.15.

♂ Muak Lek, E. Siam, 23.8.15.

♀ Tung Song, P. Siam, 19.9.15.

♀ ♂ Klong Wang Hip, P. Siam, 30.9 and 4.10.15.

2 ♂ Krabin, C. Siam, 2-9.11.15.

I can see no difference between these birds and typical Indian specimens either in size or colouration. Indeed, in so far as the material in the British Museum is concerned, I cannot divide the two races *macroura* and *tricolor*. As far as I can see the males of the two supposed races do not differ in the least from one another, and in both, the measurements of the wing vary from 89 to 101 mm.

Sclater's *suavis* is named by him on a short tailed specimen with a small wing of 91 mm., which he presumes to be a female, but which had not been sexed by the collector. In the same way Sharpe presumed his specimens also to be females, though he has given no reasons for his presumption, and the specimens had never been sexed. The males of *suavis* run from 97 to 102 mm., and the spot of black on the outermost tail feather is almost invariably very small.

114. GEOCICHLA CITRINA INNOTATA.

Geocichla innotata, Blyth, J. A. S. B. xv, p. 370 (1846).

♂ Maprit, 9.1.16. (big white spot.)

2 ♂ 2 ♀ Klong Bang Lai, P. Siam, 16-20.1.16. (Two spotted and two unspotted.)

The above series might really be called either *citrina* or *innotata*, as they are half the one and half the other. Over practically the whole of northern and central Siam *G. c. citrina* is the only form found, but in Peninsular Siam and Burma birds with, and birds without, the spot are found in about equal numbers until the extreme south of Siam is reached, when only the latter form is met with. On the other hand in eastern Burma there are well spotted specimens to be met with as far north as Karenni.

115. *MONTICOLA SOLITARIA PHILIPPENSIS.*

Turdus philippensis, Muller, Nat. Sys. Anhung, p. 142 (1776).

♂ Maprit, P. Siam, 31.12.15.

This bird answers exactly to Hartert's description (Vog. Pal. p. 675), but the variation found in *M. solitaria* over the greater part of the centre of its range is enormous, and probably there are really only two recognisable sub-species of this thrush.

116. *PLOCEUS PHILIPPINUS INFORTUNATUS.*

Ploceus passerinus infortunatus, Hart. Nov. Zool. ix, p. 579 (1902).

2 ♀ Samkok, C. Siam, 19.6.15.

2 ♂ Meklong, C. Siam, 26.6.15.

Mr. Herbert's specimens agree well with Hartert's diagnosis of his *infortunatus*, having wings between 66 and 70 mm. But a series of birds collected by Mr. Williamson at Bangkok are all very big, running from 70 to 74 mm.

117. *MUNIA ATRICAPILLA ATRICAPILLA.*

Loria atricapilla, Vieill. Ois. Chant. p. 84, pl. 53 (1805).

♂ Meklong, C. Siam, 27.6.15.

In appearance this particular individual is perhaps nearer *rubronigra* than *atricapilla*, but as the great majority of birds from this portion of Siam are much closer to the latter form I leave it provisionally under that name.

118. *UROLONCHA ACUTICAUDA ACUTICAUDA.*

Munia acuticauda, Hodgs. As. Rev. xix, p. 153 (1836).

♂ Pak Jong, E. Siam, 20.8.15.

♂ Muak Lek, E. Siam, 25.8.15.

Both these specimens are typical *acuticauda*, quite inseparable from northern Indian birds.

In working through the long series of this *Munia* in the Museum collection, I was struck with the fact that both Formosan and Hainan birds, which have hitherto been placed under the name *U. a. squamicollis*, are really far closer to *U. a. acuticauda* than they are to that bird, and if they are not deemed worthy of a separate name to themselves should bear the Indian name.

119. PASSER MONTANA SATURATA.

Stjn. Pro. U. S. Mus. viii, p. 19 (1885).

♀ Bangkok, 14.3.16.

120. HIRUNDO RUSTICA GUTTURALIS.

Hirundo gutturalis, Scop. Del. Flor. et Faun. Insubr. ii, p. 96 (1786).

♂ Samkok, C. Siam, 29.8.15.

3 ♂ 3 ♀ Bangkok, 10.2 to 14.3.16.

121. MOTACILLA BOARULA MELANOPE.

Motacilla melanope, Pall. Reis. Russ. Reichs, iii, p. 696 (1776).

♂ Muak Lek, E. Siam, 24.8.15.

122. DENDROGNATHUS INDICUS.

Motacilla indica, Gmel. S. N. i, p. 962 (1788).

2 ♂ Muak Lek, E. Siam, 22.8.15.

♀ Samkok, C. Siam, 30.8.15.

♀ Samray, Bangkok, 16.12.15.

123. ANTHUS MACULATUS.

Anthus maculatus, Hodgs. in Gray's Zool. Misc. p. 83 (1844).

2 ♂ ♀ Krabin, C. Siam, 13-14.11.15.

I have shewn elsewhere (Bull. B.O.C. xxxvii, p. 44, 1917) that *maculatus* cannot be considered the Eastern form of *trivialis*, as Witherby has named a discovery of Harington's *Anthus trivialis haringtoni*, which breeds within the same area in the Himalayas as that within which *maculatus* regularly nests.

124. ANTHUS RICHARDI RICHARDI.

Anthus richardi, Vieill. Nouv. Diet. d'Hist. Nat., xxvi, p. 491 (1818).

♂ Krabin, C. Siam, 13.11.15.

This is a rather small bird with a wing of only 92 mm., but has the huge claw to the hind-toe of *richardi*, full 19 mm. long, and also a well-developed white penultimate tail feather.

125. ANTHUS RICHARDI RUFULUS.

Anthus rufulus, Vieill. Nouv. Diet. d'Hist. Nat., xxvi, p. 494 (1818).

1 ♂ Bangkok, 30.6 to 11.7.15.

1 ♀ Samkok, C. Siam, 31.8.15 and 17.3.16.

1 ♂ Krabin, C. Siam, 30.10.15.

I cannot define any distinction between the birds of this series and others from S. India, Assam, Bengal and Upper Burma.

This Pipit is remarkably constant in size throughout the whole of its range; the usual laws creating small races in the south and large ones in the north do not seem to operate in respect to this species nor can I trace any deepening of colour in humid countries with a corresponding loss of colour in dry and desert areas.

126. *MIRAFRA CANTILLANS WILLIAMSONI*.

Baker, Bull. B. O. C. No. cex, p. 9. (1915).

5 ♂ Bangkok, 16.6 to 11.7.15.

♀ Sansep, Bangkok, 3.7.15.

♂ Samkok, C. Siam, 30.8.15.

The above 7 birds completely bear out my diagnosis of the sub-species made by me in the Bulletin, the wings of the series varying between 66 and 73 mm. There is, however, another *Mirafra cantillans* specimen obtained by Mr. Herbert on the 20th June at Samkok, which is very different to the rest. It is a huge bird with a wing of 82 mm. and though very similar in general appearance to the others, is unusually richly coloured, and has very red wings. For the present I cannot place this specimen. It is possibly only an aberrant specimen of *williamsoni*, for we cannot have two breeding races in the same area, but similar specimens should be carefully watched for and recorded.

127. *MIRAFRA ASSAMICA MARIONÆ*.

Baker, Bull. B. O. C. No. cexi, p. 34 (1915).

♂ Chan Teuk, E. Siam, 13.7.15.

♂ ♀ Krabin, C. Siam, 4.11.15.

The colouration of the above three specimens agrees well with those described in the Bulletin, but the wings measure 73, 77 and 78 mm. respectively, making the average, for the five, 75.5 mm. The smallest *assamica* I have measured has a wing of 82 mm., and they run up to over 89.0 mm.

128. *ALAUDA GULGULA SALA*.

Alda sala, Swinh. Ibis, p. 354 (1870).

♀ Sansep, Bangkok, 3.7.15.

This small Sky-Lark appears to be a very common breeding bird in Siam, where Williamson collected a fine series. The present specimen has a wing of 73 mm.

129. *ÆTHOPYGA SEHERLE CARA*.

Æthopyga cara, Hume, S. F. ii, p. 473 (1874).

♂ Maprit, P. Siam, 31.12.15.

3 ♂ ♀ juv. Maprit, P. Siam, 3-9.1.16.

3 ♂ ♀ Klong Bang Lai, P. Siam, 20.1 to 1.2.16.

All the specimens in the above series are typical *cara*.

The young male is marked "♀", but there are already a few red feathers shewing in the upper plumage which shew its correct sex.

130. *ARACHNECHTHRA FLAMMAXILLARIS FLAMMAXILLARIS*.

Nectarinia flammaxillaris, Blyth, J.A.S.B. xiv, p. 557 (1845).

2 ♂ 2 ♀ Bangkok, 18.6 to 5.7.15.

2 ♂ Muak Lek, P. Siam, 23-25.7.15.

♂ Krabin, C. Siam, 4.10.15.

2 ♂ 2 ♀ Samkok, C. Siam, 30.8.15.

1 ♀ Klong Wang Hip, P. Siam, 27.1.16.

♀ Bangkok, 7.3.16.

These are all quite typical *flammaxillaris*, and shew no approach to the Hainan race *rhizophorae*, with its metallic blue forehead.

131. *ANTHOTHREPTES MALACCENSIS*.

Certhia malaccensis, Scop. Del. Flor. et Faun. Insubr. ii, p. 91 (1786).

1 Bangkok, 18.6.15.

1 Meklong, C. Siam, 27.6.15.

132. *ARACHNOTHERA AFFINIS MODESTA*.

Anthreptes modesta, Eyton, P.Z.S. p. 105 (1839).

2 ♂ Tung Song, 15-17.9.15.

133. *ARACHNOTHERA LONGIROSTRIS LONGIROSTRIS*.

Certhia longirostris, Lath. Ind. Orn. i, p. 299 (1790).

♀ Hup Bon, S. E. Siam, 23.7.15.

3 ♂ Tung Song, P. Siam, 17-27.9.15.

♀ Klong Wang Hip, P. Siam, 9.10.15.

2 ♂ Maprit, P. Siam, 31.12.15. to 6.1.16.

♀ Klong Bang Lai, P. Siam, 16.1.16.

Before examining the above series of skins, I had received eggs of this Spider-Hunter * from Mr. Herbert, which differed so extraordinarily from those laid by it in other parts that I fully expected to find it different in some respects. A most careful examination and comparison with other series from Burma, Assam and the Malay Peninsula do not enable me to detect any difference between them.

The eggs of the Siam bird are a peculiarly dead china white, with no trace whatsoever of the pink tinge always present to a greater or lesser degree in the eggs of the Spider-Hunter laid in all other parts of its habitat. The markings consist of tiny reddish specks in a very well defined ring round the larger end.

134. CHALCOPARIA SINGALENSIS SINGALENSIS.

Motacilla singalensis, Gmel. Sys. Nat. i, p. 964 (1788).

Chalcoparia singalensis koratensis, Kloss, Ibis, 1918, p. 218.

♀ ♂ Bangkok, 14.6.15. and 3.3.16.

3♂ 2♀ Hup Bon, S. E. Siam, 17-27.7.15.

♂ Pak Jong, E. Siam, 21.8.15.

2♂ 2♀ Klong Wang Hip, P. Siam, 29.9 to 4.10.15.

♂ 2♀ Maprit, P. Siam, 2-6.1.16.

♂ Klong Bang Lai, P. Siam, 19.1.16.

After an examination of a huge series of this species I am quite unable to recognise Kloss' new sub-species "*koratensis*". I have had a series of 25 Siamese birds for comparison with over 100 specimens from more northern countries, and I can detect no differences which are of sub-specific value, and not due to individual variation.

Kloss is perfectly correct in his description of the young male bird, and in pointing out that it differs from the adult female in having no rufous on the throat and fore neck.

135. DICAËUM CRUENTATUM.

Certhia cruentata, Linn. Syst. Nat. i, p. 187 (1766).

♂ Meklong, C. Siam, 26.6.15.

* The female was shot from the nest at Klong Wang Hip, [E. G. H.]

3♂ Muak Lek, E. Siam, 23-25.8.15.

4♂ 2♀ Klong Wang Hip, P. Siam, 30.9 to 8.10.15.

♂ Krabin, C. Siam, 6.11.15.

♂ Bangkok, 17.12.15.

2 ♂ ♀ Maprit, 29.12.15 and 3.1.16.

I find it impossible to divide this species into geographical races, though at first I was disposed to separate the Chinese birds on account of the comparative greyiness of the cheeks and the sides of the neck, a feature which seems to be very fairly consistent. The Siamese birds also, at first sight, seem to be a purer white below than those from Burma and Bengal, but this is probably due to the great care with which all Robinson's and Kloss' collectors (one was employed by Mr. Herbert) make up their skins. For the present I leave all these Crimson-backed Flower-Peckers under the one name.

136. *DICAËUM CHRYSORRHOËUM*.

Dicaeum chrysorrhœum, Temm, Pl. Col. pl. 478, fig. i. (1829).

4 ♂ ♀ Muak Lek, E. Siam, 23-25.8.15.

2♂ Krabin, C. Siam, 6-7.11.15.

Birds from Sikkim to the Malay Peninsula do not seem to vary at all, either in colouration or size, but there are two specimens in the British Museum from Mt. Dulit and Kina Balu in Borneo, which probably deserve to be separated on account of their much darker plumage, and the unusually heavy dark stripes on the lower plumage.

137. *PIPRISOMA SQUALIDUM MODESTUM*.

Prionochilus modestus, Hume, Str. Feath. iii, p. 298 (1875).

2♂ 2♀ Pak Jong, E. Siam, 19-21.8.15.

4 ♂ ♀ Krabin, C. Siam, 30.10 to 7.11.15.

This form of *Piprisoma* ranges to the north as far as Cachar and the Assam Hills south of the Brahmapootra. In the hills north of this river typical *squalidum* alone is found.

138. *PRIONOCHILUS IGNICAPILLUS*.

Dicaeum ignicapilla, Eyton, P.Z.S. p. 105 (1839).

♂ juv. Tung Song, P. Siam, 11.9.15.

139. PRIONOCHILUS MACULATUS.

Pardalotus maculatus, Temm. Pl. Col. iii, pl. 600, f. 3 (1836).

♂ et ♂ juv. Klong Wang Hip, P. Siam, 8-9.10.15.

The adult male has a very white throat, and is somewhat less yellow on the under parts than usual, whilst the upper parts appear to be exceptionally dark.

140. PITTA CÆRULEA CÆRULEA.

Myiothera caerulea, Raffl. Trans. Linn. Soc. xiii, p. 301 (1822).

3 ♂ Maprit, P. Siam, 5-9.1.16.

These three birds from Siam agree well with those from the type locality, Sumatra. They are all males, so that at present one cannot say whether the females are different.

The female of the Bornean bird is quite different to that of the Sumatran and to those obtained in the Malay Peninsula. The colour of the head is a much richer, brighter brown, and the black consists of tiny black edges instead of black bars to the feathers.

This form I have recently (Bull. B. O. C. 1918, No. ccxxxvii p. 20) named *Pitta caerulea hosei* after Dr. Charles Hose, by whom the specimens were collected.

141. PITTA CYANEA.

Pitta cyanea, Blyth, J. A. S. B. xii, p. 1008 (1843).

♂ Klong Song, near Petriu, C. Siam, 25.2.16.

I cannot see any difference in this species throughout its range from Assam to Malaya.

142. PITTA CYANOPTERA.

Pitta cyanoptera, Temm. Pl. Col. pl. 218 (1823).

2 ♂ ♀ Hup Bon, S. E. Siam, 22.7.15.

These specimens call for no remark.

143. PITTA CUCULLATA.

Pitta cucullata, Hartl. Rev. Zool. 1843, p. 65.

2 ♂ ♀ Hup Bon, S. E. Siam, 18-27.7.15.

144. PITTA GURNEYI.

Pitta gurneyi. Hume, Str. Feath. iii, p. 296, pl. iii, (1875).

♂ ♀ Klong Wang Hip, P. Siam, 1-9.10.15.

3 ♂ ♀ Maprit, P. Siam, 5.1.16.

♂ ♀ Klong Bang Lai, P. Siam, 17-21.1.16.

145. PITTA BOSCHI.

Pitta boschi, Muller and Schl. Vert. Zool. Pitta, p. 5.

2 ♂ 4 ♀, ♂ juv. ♀ juv. Tung Song, P. Siam, 12-19.9.15.

juv. o, Klong Wang Hip, P. Siam, 5.10.15.

The plumages of the young birds which are in various stages are very interesting. In the earliest stage represented the plumage is dull brown everywhere except on the throat, which is white. The feathers of the head, neck, upper back, breast and flanks have pale fulvous central stripes. The darker cheeks and ear-coverts are already distinguishable, and the quills are brown without any indication of the white band.

In a somewhat older bird the breast feathers are fulvous with fine black margins only, the crown and forehead are nearly black with broad pale striæ; the nape is a golden fulvous or buff; the upper back brown with pale centres to the feathers, and the lower back and wing-coverts brown with each feather edged darker. The quills are the same as in the adult bird.

From this stage the bird apparently moults into the full male and female adult plumage.

146. EURYLEMUS JAVANICUS.

Eurylaimus javanicus, Horsf. Trans. Linn. Soc. xiii, p. 170 (1821).

♀ Hup Bon, S. E. Siam, 16.7.15.

2 ♂ Chan Teuk, E. Siam, 10.8.15.

The female from Hup Bon is in juvenile plumage. The two males both have the abdomen and vent a very chestnut red rather than vinaceous red as it is on the breast. This may be due to the fact that these two specimens have not yet acquired their full colouration.

147. EURYLEMUS OCHROMELAS.

Eurylaimus ochromelas, Raf. Trans. Linn. Soc. xiii, p. 297 (1822).

♂ ♀ ♂ semi-adult. Tung Song, P. Siam, 10.9.15.

The young male is in plumage similar to that of the adult

male, but already shews signs of acquiring the black pectoral band.

148. CORYDON SUMATRANUS.

Coracias sumatranus, Raff. Trans. Linn. Soc. xiii, p. 303 (1822).

♂ ♀ Hup Bon, S. E. Siam, 25.7.15.

149. CYMBORHYNCHUS MACRORHYNCHUS MALACCENSIS.

Cymborhynchus malaccensis, Salvad. Att. R. Ac. Sc. ix, p. 425 (1874).

♂ Chan Teuk, E. Siam, 13.8.15.

3 ♂ ♀ Klong Wang Hip, P. Siam, 5-8.10.15.

2 ♂ Klong Bang Lai, P. Siam, 26.1.16.

Whilst comparing this series with others from the Peninsula and from Borneo and Sumatra, I also compared birds from the two latter islands with one another, and in the result am unable to distinguish between them. As a rule the Sumatran birds have a little more white on the tail feathers, but this distinction does not always hold good. In size the two birds are the same, Sumatran birds having the wings between 95 and 102 mm., and Bornean between 95 and 101 mm.

150. SERILOPHUS LUNATUS LUNATUS.

Serilophus lunatus, Swainson, Class B, ii, p. 263.

♀ Hup Bon, S. E. Siam, 27.7.15.

♂ 2 ♀ Tung Song, P. Siam, 16-20.9.15.

2 ♂ Klong Bang Lai, P. Siam, 19-29.1.16.

In this series the variation in the pretty white tipping to the feathers on the side of the neck of the female varies very greatly in extent; in one it is more strongly developed than in the majority of *S. l. rubropygius*, in a second it is much the same as in normal birds of that race, but in the third it is obsolete.

151. CALYPTOMENA VIRIDIS.

Calyptomena viridis, Raff. Trans. Linn. Soc. xiii, p. 295. (1822)

♂ o Tung Song, P Siam, 21-22.10.15.

252. PICUS CANUS HESSEI.

Gecinus occipitalis hessei, Gyldenstolpe, Orn. Monatsb. xxiv, p. 28 (1916).

♂ Krabin, C. Siam, 12.11.15.

In the Ibis 1919, p. 184 I have shewn that I agree with Gyldenstolpe in differentiating between the Siamese birds and those from northern India, whether these latter are the large green birds from extreme north-western Himalayas or the smaller bronzed birds from Sikkim and Assam. I cannot, however, distinguish in any way between the birds from Siam and those of practically the whole of Burma. Accordingly, as there is no name which is applicable to the Burmese form, this, together with birds from Siam, must bear his name *hessei*.

153. PICUS VITTATUS VITTATUS.

Picus vittatus, Vieill. Nouv. Dict. d'Hist. Nat. xxvi, p. 91 (1818).
Gecinus vittatus eisenhoferi, Gyldenstolpe, Orn. Monatsb. xxiv, p. 28 (1916).

♂ 2 ♀ Bangkok.

♂ Hup Bon, S. E. Siam.

♀ Pak Jong, E. Siam.

I am rather doubtful as to whether Gyldenstolpe's *eisenhoferi* can be maintained. Kloss (Ibis, 1918 p. 104) gives some interesting measurements shewing how this species decreases in size the further it extends to the south, but says that he can find no differences in colour between the northern and southern specimens. With this latter opinion I fully agree, and moreover, after an examination of the excellent material in the British Museum, it does not appear that the diminution in size southwards is nearly so pronounced in this particular species as Kloss' figures would make out.

The following are the measurements of 34 birds, excluding Mr. Herbert's:—

Java	12 birds, wing, 123-137 mm. average, 130 mm.
Malay States	9 " " 123-132 mm. " 127.6 mm.
Cochin China	5 " " 128-136 mm. " 132 mm.
Siam	8 " " 128-143 mm. " 137.2 mm.

Mr. Herbert's birds measure:—

Pak Jong,	E. Siam, wing, 149 mm.	} average, 141 mm.
Bangkok,	C. " " 136 mm.	
"	" " " 137 mm.	
"	" " " 140 mm.	
Hup Bon, S. E.	" " 144 mm.	

Perhaps even more material is necessary before we can decide the status of *eisenhoferi*, and if accepted, how far south its area should be held to extend.*

For the present I retain all the Siamese birds under the name *vittatus*.

154. PICUS VITTATUS VIRIDANUS.

Picus viridanus, Blyth, J.A.S.B. xii, p. 1000 (1843).

2 ♀ Maprit, C. Siam, 30.12.15. and 10.1.16,

These are apparently the first specimens of true *viridanus* received from Siam in the British Museum, for I find that all those which have been labelled *viridanus* are nothing but *vittatus*.

Herbert's birds are very fine specimens, the barring on the under-parts coming right up to the upper breast in stronger, better defined bars than in any of the Burmese skins in that collection. The wings of the two birds measure respectively 135 and 139 mm.

As an examination of the material in the British Museum and elsewhere does not enable me to maintain Gyldenstolpe's sub-species *eisenhoferi*, there appear to me to be only two sub-species, viz., *G. v. viridanus*, which is found throughout Burma, Chin Hills, Kachin Hills, south Shan States, north and central Siam, and possibly extreme west of Peninsular Siam and Burma.

G. v. vittatus, which is found from Java, Malay States, east and west Peninsular Siam and Burma, in South-Eastern Siam and as far north as Pak Jong in eastern Siam, and thence again, if Gyldenstolpe is correct, in assigning his birds to the *vittatus*, rather than the *viridanus* group, well up into north central Siam and Cochin China.

In a letter to me Mr. Herbert remarks on the fact not, I think, hitherto recorded, of the great part taken in incubation by the male birds of most species of Wood-pecker.

* The following are the wing measurements of 14 birds in Mr. Williamson's collection:—

4	birds from	E. Siam,	wing average	142 mm.
3	" "	C. "	" "	134 mm.
3	" "	S. E. "	" "	141 mm.
4	" "	S. W. "	" "	135 mm.
Average wing measurement of 14 birds=				138 mm. [Eds.]

"As regards *vittatus* and its eggs, the male was taken on the nest with the clutch. There were also some clutches of eggs taken of the little Pied Wood-pecker, and in several instances the male bird was caught on the eggs or shot as he left the nest-hole. I think I have also known two similar instances with *Tiga javanensis*."

I may remark that I have observed the same habit with both the genera *Chrysocolaptes* and *Chrysophlegma*. Of these the male undoubtedly does the major share of the incubation, at all events, by day. By night I think with many Wood-peckers, both parents sleep within the nest-hole, but it is of course difficult to make really accurate observations after dark.

As regards *Micropternus*, male and female are too much alike to make it possible to discern which leaves the nest-hole unless the bird is actually shot, and as they nearly all lay their eggs in tree-ants' nests, it is never possible to catch them on the nest itself.

155. BLYTHIPICUS PORPHYROMELAS.

Venilia porphyromelas, Boie. Briefe. Geschr. aus Ostend. p 143 (1832).

♀ Klong Bang Lai, P. Siam, 29.1.16.

The generic name *Venilia* is preoccupied in both Lepidoptera and Mollusca, and the next oldest name appears to be *Blythipicus* of Bonaparte (1850), and however ridiculous some ornithologists may consider such hybrid names to be, this is no reason for discarding them.

This specimen is quite typical, and calls for no remark.

156. MIGLYPTES TRISTIS GRAMMITHORAX.

Phaiopicus grammithorax. Mall. Picidae, ii, p. 12, pl. xlviii, fig. 6 (1862).

♀ Tung Song, P. Siam, 26.9.15.

♀ Klong Wang Hip, P. Siam, 29.9.15.

♂ Klong Bang Lai, P. Siam, 26.1.16.

Two of the above three specimens are noticeable for the absence of all tinge of rufous in the pale markings of the

plumage; the lores, forehead and chin are almost yellow when compared with the rufous of most specimens. The third specimen is normal in this respect.

157. MIGLYPTES JUGULAREIS.

Picus jugularis, Blyth, J.A.S.B. xiv. p. 195 (1845).

2 ♂ Hup Bon, S. E. Siam, 21-25.7.15.

♂ ♀ Pak Jong, E. Siam, 29-30.11.15.

One of the males which is acquiring the black plumage above has the breast suffused with sage-green as in the nestling stage.

158. CHRYSOPHLEGMA FLAVINUCHA PIERREI.

Chrysophlegma pierrei, Oustalet, Le Naturaliste, 1889, pp. 44, 45.

♀ Chan Teuk, E. Siam, 11.8.15.

♂ Pak Jong, E. Siam, 1.12.15.

These two birds are both good examples of the rare *C. f. pierrei*. The male has a wing of 152 mm., and the female 148 mm., whilst the type of *pierrei*, which is a female, has a wing of 156 mm. They also have the decidedly pale upper and lower plumage of *pierrei* contrasting well with typical *wrayi* in this respect.

Kloss' *C. f. lylei* (Ibis 1918, p. 110.) is assuredly nothing but *pierrei*, the small differences mentioned by him as shewn in his specimen not being discernible in either of Mr. Herbert's birds.

The two birds described by Gyldenstolpe under the name of *flavinucha* are probably, judging by the wing measurements, (♂ 153, ♀ 159 mm.), this race also, as true *flavinucha* would seem to have wings measuring from 162 to 180 mm.

159. CHRYSOPHLEGMA HUMII.

Chrysophlegma humii, Hargitt, Ibis 1889, p. 231.

♂ ♀ Tung Song, P. Siam.

The two specimens in Mr. Herbert's collection are quite typical *humii*.

160. CALLOLOPHUS MINEATUS MALACCENSIS.

Picus malaccensis, Lath. Ind. Orn. i, p. 241, (1790).

Callolophus mineatus perlutus, Kloss, Ibis, 1918 p. 110.

♂ Klong Bang Lai, P. Siam, 23.1.16.

This bird agrees perfectly with typical *maluccensis*, which varies greatly in size in the same locality.

Kloss' *C. m. perlatus* appears to me to be nothing more than *maluccensis*. It is described, as is *C. f. lylei*, from a single specimen.

161. *DENDROCOPUS PECTORALIS PECTORALIS*.

Picus pectoralis, Blyth J. A. S. B. xv, p. 15 (1846).

2 ♂ ♀ Bangkok, 5. 7. and 17.12.15.

These specimens are quite normal, and call for no remark.

162. *CHRYSOCOLAPTES GUTTACRISTATUS DELESSERTI*.

Indopicus delesserti, Malh. N. Class. Mem. Acad. Metz (1848) p. 343.

♂ Krabin, C. Siam, 2.11.15.

♂ Maprit, P. Siam, 2.1.16.

♂ Klong Bang Lai, P. Siam 30.1.16.

Elsewhere, (Ibis 1919 p. 197), I have shewn that I cannot divide the birds of Southern India from those of Peninsular Burma and Siam, so they all must bear Malherbe's name of *delesserti*. The other subspecies which seem to me to be good are *C. g. gutta-cristatus* from Bengal, North and South Assam and Burma, and *C. g. sultaneus* from North-West India and Nepal. It is one of the many cases of parallel evolution of sub-species of northern birds as they descend south in India and Burma, carried out in this instance to an unusually similar result.

163. *MICROPTERNUS BRACHYURUS WILLIAMSONI*.

Kloss, Ibis 1918 p. 197.

♀ Meklong, C. Siam, 28.6.15.

♂ Samkok, C. Siam, 31.8.15.

♂ Bangkok, 6.3.16.

The Samkok bird may be wrongly sexed, as it shews no trace of the red moustache, although it appears to be fully adult. The wings of the three birds measure respectively ♀ 123 mm., ♂ 120 and 122 mm.

Kloss has recently described this new sub-species from a single specimen collected at Koh Lak, S. W. Siam. Unfortunately

the differences which he quotes as distinguishing it from its nearest allies are all more or less individual rather than sub-specific in character except, perhaps, the "narrower dark bars on the wings and back" (? lower back).

Mr. Herbert's three specimens and two others from Siam in the British Museum collection all agree with one another in one feature—rarely found in birds from elsewhere—the non-existence of any barring on the scapulars and upper back. They average also rather light in the tint of their plumage generally. In two of Mr. Herbert's birds there is no barring on the under plumage also, whilst in the third the bars are confined to the flanks only. Of the two Museum specimens one is immaculate below, the other more than usually profusely barred.

All five birds have the centres of the throat feathers concolorous with the breast; all have red shafts to the wing quills, but in two the bases of the shafts are marked with blackish.

If it is eventually found that the Siamese *Micropterni* all have immaculate backs the name will have to be confined to this race; otherwise, the name will still hold good for birds from Siam and Burma. There is at present no name for the race north of Bangkok, (vide, Baker, Ibis 1919 p. 202) should this be separated.

164. MICROPTERNUS BRACHYURUS BRACHYURUS.

Picus brachyurus, Vieill. Nouv. Dict. d'Hist. Nat. xxvi, p. 103 (1818).

♀ Klong Wang Hip, P. Siam, 4.10.15.

2 ♂ Krabin, C. Siam, 2-14.11.15.

All three of these birds are very typical *brachyurus* with dark throats, very black shafts to the wing quills, and densely barred lower plumage. They are, however, larger than most south Malayan birds, the wings being 117, 127 and 123 mm. respectively.

165. TIGA JAVANENSIS INTERMEDIA.

Picus intermedius, Blyth J. A. S. B. xiv, p. 193 (1845).

2 ♂ ♀ Samkok, C. Siam, 21-22. 6. 15.

♀ Hup Bon, S. E. Siam, 21. 7. 15.

♀ Pak Jong, E. Siam, 19. 8. 15.

2 ♂ ♀ Krabin, C. Siam 3-7. 11. 15.

I have already dealt with this species and its geographical races at some length in the Ibis 1919, p. 205, and it is therefore unnecessary for me to go into further detail here. All the specimens collected by Mr. Herbert agree well with Blyth's *intermedius*, which only differs in being smaller. The average wing measurement for 159 specimens of *intermedia* is 144.4 mm., whilst Mr. Herbert's birds have wings ranging from 135 to 149 mm., and averaging 143 mm., the two smallest birds coming from Samkok.

The average wing measurement for *T. j. javanensis* is under 130 mm.

166. GAUROPICOIDES RAFFLESI PENINSULARIS.

Hesse, Orn. Monatsb. xix, p. 192 (1911).

† Tung Song, P. Siam, 25. 10. 15.

This specimen does not agree with the rather doubtful form described by Hesse under this name. It is said to differ from typical *G. rafflesii* from Sumatra, in having red upon the upper tail-coverts and also in being much bigger.

In size the two forms do differ to some extent, nine Sumatran birds having a wing averaging 138 mm., whilst thirty-nine Peninsular birds have the same 134 mm. Mr. Herbert's specimen has a wing of 150 mm., but no red upon the upper tail-coverts.

This latter characteristic seems to be a very uncertain one. Of the series in the British Museum, some ten adult birds have no tinge of red, whilst the other ten have it to a greater or less extent. On the other hand, one so-called Sumatran skin has this red tinge quite apparent.

More skins from Sumatra are badly wanted, for of those in the Museum the majority have only got dealers' data tickets, and only one has an original collector's ticket. Two specimens, moreover, look suspiciously like Malaccan dealers' skins, and one cannot lay down any sound diagnosis on material of this nature.

167. HEMILOPHUS PULVERULENTULUS HARTERTI.

Motacilla pulverulentulus harterti, Hesse, Orn. Monatsb. p. 182 (1911).

♂ Hup Bon, S. E. Siam, 27.7.15.

♀ Klong Wang Hip, P. Siam, 5.10.15.

♀ Hinlap, E Siam, 9.12.15.

♀ Klong Bang Lai, P. Siam, 13.1.16.

Hesse's sub-species is a quite good one, and birds from Assam and Burma are easily distinguishable by their much lighter colour than birds from Java, Sumatra, Borneo and Palawan, etc. From the extreme south of the Malay Peninsula birds are somewhat intermediate, one from Singapore and another from Johore being almost as black as any Java bird. Most specimens from the south of the Peninsula are nearer the northern forms, and should, therefore, be kept with them. As usual, the southern birds average a trifle smaller than the northern, but are not sufficiently so to constitute a third sub-species.

Birds from Assam, average wing 238 mm., and bill 49.5 mm.; Javan birds measure only wing 223 mm., bill 48.0 mm. These form the two extremes in size, but even in these two areas they have not much significance, as we have one specimen in the British Museum collection from northern Burma with a wing of only 218 mm., whilst another from Borneo has a wing of no less than 241 mm.

168. *SASIA ABNORMIS ABNORMIS*.

Picumnus abnormis, Temm. Pl. Col. iv, pl. 371, fig. 3. (1825).

2 ♂ Tung Song, P. Siam, 11-23.9.15.

2 ♂ Klong Wang Hip, P. Siam, 9-10.10.15.

♀ Maprit, P. Siam, 10.1.16.

All this series belong to this form of Piculet. Judging from their distribution, the birds with white eye-brows, *Sasia ochracea* (and sub-species) and those without any white round the eye, *Sasia abnormis*, form two good species. Both birds inhabit the same portions of the northern Malay Peninsula and Siam, and cannot therefore be sub-species of one species.

169. *THEREICERYX LINEATUS INTERMEDIUS*.

Stuart Baker, Bull. B. O. C. 1918, p. 19.

♂ Chan Teuk, E. Siam, 9.8.15.

♂ Pak Jong, E. Siam, 16.8.15.

♂ Krabin, C. Siam, 2.11.15.

The birds of central and south Burma and of south Siam seem to be intermediate in size between those of Java—*T. l. lineatus*—and those of northern India—*T. l. hodysoni*--and as they cover a far longer range than either of these two extreme races, they should bear a name as a geographical race.

The typical birds from Java and Bali are very small, thirteen birds having an average wing measurement of about 117 mm. These are found only in the two Islands named.

Birds from the northern area are very large, averaging nearly 131 mm. in wing length. These are found over the whole of Northern India, Chin and Kachin Hills, Shan States and Siam, though exactly where the Siamese birds meet the next race cannot be determined on the material available. This northern race bears Hodgson's name, and it is possible that yet another race in N. W. India should be separated, as it is again much larger with a wing of over 137 mm.

T. l. intermedius, as its name denotes, is half-way between the two extremes, and 71 birds have an average length of wing of 124 mm.

170. THEREICERYX FAIOSTRICTA FAIOSTRICTA.

Bucco faiostrictus, Temm. Pl. Col. iii, pl. 227 (1831).

Thereiceryx flavostrictus praetermissus, Kloss, Ibis, 1918 p. 101.

♀ Hup Bon, S. E. Siam, 21.7.15.

Kloss has recently named some Barbets obtained by Neumann in south China under the name quoted above on the grounds of difference in size, but this reason does not seem to be sufficient.

There are no Chinese birds in the British Museum, but there are 8 of Neumann's in Tring, and these differ from other birds in having no red patch on the side of the throat, a character which will suffice to maintain Kloss' name.

The size of the Chinese birds, as stated by Kloss, is, "wing measurements 112 to 118 mm." Count Gyldenstolpe has a fine series of 13 birds, and these measured on the curved wing are between

110 and 115 mm., practically exactly the same as Neumann's; Robinson records his four birds as over 112 mm., and all others, except the type of *saigonensis* vary between 108 and 112 mm.

This type is apparently an abnormally small bird of only 102 mm., and until it is proved that it is not only the type, but that it is really typical of a very small South-Eastern race, *saigonensis* must rank as a synonym of *faiostricta*.

171. CHOTORHEA MYSTOCOPHANES.

Bucco mystocophanes, Temm. Pl. Col. iii, pl. 315 (1824).

♂ Tung Song, P. Siam, 20.9.15.

This is an extension of the hitherto recorded habitat of this little Barbet, but I can see no difference between this specimen and a series from the Malay Peninsula.

On the other hand when a series from the latter locality is compared with a series from Borneo the females of the Malay Peninsula seem to have a much yellower throat and chin. In the Bornean birds the blue often runs up practically to the angle of the bill, and in nearly every case the throat is more or less suffused with this colour. In the Malay Peninsula birds and in those from South Tenasserim the chins and throats are yellowish with no tinge of blue at all.

I cannot separate Oberholser's sub-species *C. m. ampala* from Tana Balu. All Oberholser says is that it is larger with a bigger red patch, but he gives no measurements for comparison.

172. CHOTORHEA CHRYSOPOGON CHRYSOPOGON.

Bucco chrysopogon, Temm. Pl. Col. iii, pl. 315 (1824).

2 ♂ ♀ Tung Song, P. Siam, 14-20.9.15.

The lower surface in these specimens is very green, and less yellow than in any of the big series in the British Museum from any other locality, but they are also better made, fresher skins in perfect condition, and this may account for the difference.

The wings measure between 131 and 134 mm.

173. CYANOPS ASIATICA? INCOGNITA.

Megalaima incognita, Hume, Str. Feath. ii, pp. 442, 472, 486 (1874).

♂ ♀ Tung Song, P. Siam, 24.9.15.

This is a rare and little known bird in collections, and it is with some doubt that I apply the name to Mr. Herbert's specimens.

Incognita differs from *C. a. davisoni* principally in having the scarlet patch confined to a spot in the middle of the nape, and not extended across it. It also differs in having the chin and throat a very pale washed-out blue instead of an intense azure blue as in *asiatica*.

Mr. Herbert's two birds do not agree well with *incognita*, as they have broad red foreheads, and no black moustachied streak and no yellow feathers round the eye, whilst the head above is more blue. Both specimens are young birds, and in the absence of more adult material, I forbear to name them, but it will be interesting to obtain a further series, and see if these differences are confirmed.

The feathers on the side of the crown in the older bird are moulting, and the new feathers are also blue, shewing that there will be no change into the broad red coronal band of *asiatica*.

174. CYANOPS DUVAUCELI CYANOTIS.

Bucco cyanotis, Blyth, J. A. S. B. xvi, p. 465 (1847).

Mesobucco duvauceli orientalis, Robinson, Ibis, p. 738 (1915).

♀ Hup Bon, S. E. Siam, 23-27.7.15.

2 ♂ 2 ♀ Hinlap, E. Siam, 6-8.12.15.

The 6 birds,—possibly prepared by the same skinner—are, even to the most minute details, exactly the same as those from Ok-Yam, upon which Mr. Robinson has founded his new sub-species. Mr. Herbert's birds are quite typical *cyanotis* and are replicas of many others from Sikkim, Cachar, and Northern Burma. They are, however, beautiful skins, and shew up as very clean bright specimens when placed amongst a large number of dirtier, less well-made skins; on the other hand, they are in no way different from specimens which are equally nicely prepared. Mr. Robinson separates his new sub-species on the ground that it is bigger than *cyanotis* with a wing of 83 and 84 mm.; but *cyanotis*, from all over the area it inhabits, runs up to 86 and even 87 mm. As regards the yellow intermixture in the red below the eye, this obtains also in many

individuals over an equally wide area, though, often, the feathers below the eye are injured or lost in the preparation of the skin.

175. *CALORAMPHUS FULIGINOSA* HAYI.

Bucco hayi, J. E. Gray, Zool. Misc. p. 33 (1831).

♂ Tung Song, P. Siam, 24.9.15.

176. *XANTHOLEMA HÆMATOCEPHALA* INDICA.

Bucco indicus, Lath. Ind. Orn. i, p. 205 (1790). India.

2 ♂ 2 ♀ Sansep, Bangkok, 3-4.7.15.

2 ♀ Klong Wang Hip, P. Siam, 3-6.10.15.

5 ♀ Krabin, C. Siam, 30-31.10.15.

♂ Samray, Bangkok, 6.3.16.

The type locality for *Bucco hæmatocephalus* Muller, is the Philippines, and this bird has a much bigger bill than that from other localities, including Siam, which must bear Latham's name of *indicus*. Employing Kloss' excellent method of measuring, i. e., from the point of the nostrils to the tip of the bill, I find that in no case does the bill exceed 15 mm., and it varies from 13 to 15 mm. In the Philippine birds it is never less than 16, and runs up to 18 mm. In size the bird itself is much the same as those from elsewhere, having a wing of 82 mm. exactly.

In colour the Philippine bird is generally darker, a more bluish green, especially on the primaries.

177. *CORACIAS AFFINIS*.

Coracias affinis, McClelland, P. Z. S. p. 164 (1839).

♀ Samkok, C. Siam, 21.6.15.

♂ ♀ Krabin, C. Siam 3-15.11.15.

The question as to whether *Coracias affinis* and *Coracias indicus* are races of the same species is very doubtful. That they are representative species is of course true, and some naturalists would consider this sufficient reason to call them sub-species. As a rule, however, geographical races, except island forms, grade into one another gradually, where the two forms meet. With these birds such is not the case, for at the principal meeting-place, Eastern Nepal, Sikkin and Bhutan most specimens are easily referable to

one or the other, some are halfway between the two, whilst others are more one than the other. Certainly, if we judge from the birds obtained in these districts, we should say that they were the result of hybridization rather than specimens of two forms intergrading.

On the other hand, one finds individuals of each form in the area inhabited by the other; as for instance in Calcutta, specimens of *C. affinis* occur, and again in Cachar and Sylhet I have seen almost equally typical specimens of *C. orientalis*.

For the present I leave this Roller under a bi-nomial.

178. EURYSTOMUS ORIENTALIS CALONYX.

Eurystomus calonyx, Sharpe, P. Z. S. 1890, p. 551, Nepal.

♂ Pak Jong, E. Siam, 18.8.15.

♀ Muak Lek, E. Siam, 25.8.15.

♀ Klong Wang Hip, P. Siam, 30.9.15.

The three specimens obtained by Mr. Herbert in Siam, agree well with others in the British Museum from the same country. They are not very typical *calonyx*, but are nearer this form than *orientalis*. The secondaries and greater wing-coverts have a fair amount of blue on them, but the tails have very little. The differences between *E. o. calonyx* and *E. o. orientalis* are not very great, how slight they are is best realised when we find Sharpe often naming two birds from the same place, the one by one name and the other by the second name.

179. MEROPS SUPERCILIOSUS PHILIPPINUS.

Merops philippinus, Linn. Syst. Nat. 13th Ed. 1, p. 183 (1787).

Type locality, Philippine Islands.

♂ Samkok, C. Siam, 21.6.15.

♀ Paknam, C. Siam, 14.2.16.

180. MELITTOPHAGUS ERYTHROCEPHALUS ERYTHROCEPHALUS.

Merops erythrocephalus, Gmelin, Syst. Nat. 1, p. 463 (1778). India.

♂ Klong Wang Hip, P. Siam, 2.10.15.

Gmelin's description seems to be quite satisfactory, and there is no reason why his name should not be used. The original description of *Apiaster indicus erythrocephalus* as given in Brisson (Av. 4, p. 563 n. 13, p. 44, f. 3A) is also equally so.

181. NYCTIORNIS AMICTUS.

Merops amictus, Temm. Pl. Col. iv, pl. 310 (1824).

♂ Tung Song, P. Siam, 12.9.15.

♂ Klong Wang Hip, P. Siam, 4.10.15.

182. CERYLE RUDIS LEUCOMELANURA.

Ceryle leucomelanura, Reichenbach, Hand-L. Alced. p. 21, Taf. 409 B. fig. 3488. (Decr. 1851).

♂ 2 ♀ Bangkok, 18-21.6.15.

♂ Samkok, C. Siam, 31.8.15.

183. ALCEDO ISPIDA BENGALENSIS.

Alcedo bengalensis, Gml. Syst. Nat. i, p. 450 (1788).

2 ♂ ♀ Krabin, C. Siam, 6-16.11.15.

♂ Paknam, C. Siam, 14.2.16.

♂ ♀ Samray, Bangkok, 6.3.16.

♂ Samkok, C. Siam, 16.3.16.

The wings of the males measure from 69 to 72 mm., and the females from 69 to 71.5 mm. They thus average a little small for this form, but possibly a larger series would prove to be of the normal standard. In colour they are quite typical *bengalensis*.

184. ALCEDO MENINTING SCINTILLANS.

Alcedo meninting scintillans, Stuart Baker, Bull. B. O. C. 1918, No. cccxxviii, p. 38.

Type ♂ No. 87.8.20. 1698. Hume Coll. B. M.

Type locality, Bankasoon.

♀ Klong Wang Hip, P. Siam, 1.10.15.

Above this bird is a rather deeper, more purple-blue than *asiatica*, (the proper name for the Bengal and Indian bird generally called *beavani*), this being especially noticeable on the head. Scapulars black.

Wing 62-66 mm.; bill 32-35.5 mm. (19 specimens).

In North and Central Siam another form is found which I have recently named *A. m. coltarti*, and which extends from Assam and Sikkim through Burma north of the above form *scintillans* and in the Chin Hills, Shan States and Cochin China. It is similar to *asiatica*, but a good deal smaller, and when viewed as a series,

rather lighter, less black or blue, on the back. The spots on the wing-coverts are smaller, but lighter and more conspicuous. The wing varies from 62-69 mm. instead of 69-72 mm. as in *asiatica*.

185. HALCYON PILEATA.

Alcedo pileata, Bodd. Tabl. Pl. Enl. p. 41 (1783).

♂ Krabin, C. Siam, 31.10.15.

♂ Pak Jong, E. Siam, 4.12.15.

♂ Samray, Bangkok, 17.12.15.

2 ♂ 2 ♀ Samray, Bangkok, 7-11.3.16.

Mr. Herbert's fine series of this widely-spread Kingfisher calls for no remark. Over the whole of its range in China, Siam, Burma, India and the Malay Peninsula and the Islands, I can see no variation in size or plumage which necessitates its division into geographical races.

186. HALCYON SMYRNENSIS FUSCA.

Alcedo fusca, Bodd. Tabl. Pl. Enl. p. 54 (1783).

♂ Krabin, C. Siam, 15.11.15.

Calls for no remark.

187. CARCINEUTES PULCHELLUS AMABILIS.

Carcineutes amabilis, Hume, Str. Feath. i, p. 474 (1873).

Type locality, Pegu Hills.

♂ Hup Bon, S. E. Siam, 19.7.15.

♂ Muak Lek, E. Siam, 24.8.15.

♀ Tung Song, P. Siam, 17.9.15.

2 ♂ ♀ Hinlap, E. Siam, 7.12.15.

The difference between the males of *C. p. pulchellus* and *C. p. amabilis* is very slight, though, as Hume points out, the rufous collar in the latter is obsolete or very ill-defined. The females are, however, conspicuously different from one another, those from Tenasserim northwards and eastwards being much redder above than those from south of that province. The under-parts, also, are somewhat less boldly spotted.

The gradation in size from north to south is not very marked north and central Burmese birds run from 81 to 94 mm. in wing measurement, those from south Burma and Siam 80 to 90 mm., and those from the Malay Peninsula from 78 to 87 mm.

The Siamese birds vary between 87 and 91 mm.

188. *SAUROPATIS CHLORIS CHLORIS*.

Alcedo chloris, Bodd. Tabl. Pl. Enl. p. 49, Lath. Syn. B. i, p. 620 (1783).

Type locality, "Bouru, one of the Molucca Islands."

3 ♂ Bangkok, 4.6.15. and 6-7.3.16.

♂ Meklong, C. Siam, 20.6.15.

Robinson (*Ibis* 1911, p. 34) has already pointed out that *Sauropatis humei* and *Sauropatis armstrongi* are one and the same bird, and he adds that he doubts whether they are not identical with *S. chloris*. With Robinson's conclusions I am in complete accord, and after a most careful consideration of the mass of material in the British Museum—about 200 specimens—have no doubt that all three so-called races must be lumped together.

189. *RAMPHALCYON CAPENSIS BURMANICA*.

Pelargopsis burmanica, Sharpe, P. Z. S. 1870 p. 67 (Toung-hoo).

2 ♂ o Krabin, C. Siam, 29.10 and 4-10.11.15.

Sharpe's division of this Kingfisher into different species has led to the most curious confusion. He admitted two and even three subspecies from the same locality, and the consequent mixture of different species under the same name, and splitting up of other species under various names, has rendered the magnificent series in the British Museum very difficult to work. The result of my recent examination has been given in *Novitates Zoologicae*, 1919, and therein it is shewn that the Siamese birds are all of this race, which is widely extended over the whole of Burma, Siam and Cochin China.

The wings of Mr. Herbert's birds vary from 143 to 154 mm., and the bills from 67 to 72 mm.

190. *DICHOCEROS BICORNIS*.

Buceros bicornis, Linn. Syst. Nat. i, p. 153 (1766).

♀ Hup Bon, S. E. Siam, 20.7.15.

191. *ANORRHINUS GALERITUS*.

Buceros galeritus, Temm. Pl. Col. pl. 520 (1824).

♀ Tung Song, P. Siam, 15.9.15.

192. ANTHRACOCEROS ALBIROSTRIS ALBIROSTRIS.

Buceros albirostris, Shaw and Nodd. Nat. Misc. xix, p. 819 (1790).

2 ♂ ♀ Hup Bon, S. E. Siam, 17-24.7.15. (wing ♂ ♂ 270 and 276 mm., ♀ 244 mm.)

Gmelin's name *malabaricus* does not apply to this bird at all. His bird is named after the Calao de Malabar, Buffon, Hist. Nat. des Ois., and here a good plate is given which shews that *malabaricus* is the same as *coronatus*, the outer tail feathers proving this beyond all doubt.

Shaw and Nodder give both description and plate of *albirostris* from India, and it is probable that the proper name for the Burmese form is *leucogaster* of Blyth (J. A. S. B. x, p. 922, 1841) described from a bird sent by a Mr. Bark from Tenasserim with some other skins of birds and mammals.

193. UPUPA EPOPS LONGIROSTRIS.

Upupa longirostris, Jerdon, B. of Ind. i, p. 383 (1864).

♂ ♀ Chan Teuk, E. Siam, 9-14.8.15.

♂ Krabin, C. Siam, 12.11.15.

All races of the Eastern Hoopoe, *i. e.*, of races east of Sikkim, are distinguished by being much larger than those to the west, and with having an even proportionately longer bill on an average, though abnormal birds are found everywhere with very long bills. Thus in Ceylon the average is only 47.5 mm. in a small series, but there is one bird with a bill of 57 mm. In Southern India a large series averages 48 mm. exactly, but there is one specimen which has a bill of 73 mm.

Assam birds are huge, and have wings averaging 146.1 mm. and bills of 54 mm.; Burmese birds have these measurements respectively, 139.5 mm. and 54.5 mm., whilst Siam birds have wings of 142.5 mm. and bills just over 51 mm.

Under the circumstances I retain them under the name *longirostris*, the Assam birds forming a link with the still larger Tibetan form *saturata*.

194. CAPRIMULGUS MACRURUS BIMACULATUS.

Caprimulgus bimaculatus, Peale, U. S. Exped. En. vol. viii, p. 170 (1848).

♂ ♀ Klong Wang Hip, P. Siam, 8-9.10.15.

♂ ♀ Krabin, C. Siam, 1-5.11.15.

♀ Pak Jong, E. Siam, 2.12.15.

♂ ♀ Hinlap, E. Siam, 9.12.15.

Oberholser has shewn (Proc. U. S. Mus., v. 1e, p. 595, 1915) that the name *bimaculatus* precedes Hartert's *ambiguus* for this race of *macrurus*.

Mr. Herbert's Siamese birds are very large, three of the females measuring 200, 201 and 211 mm. respectively.

195. CAPRIMULGUS ASIATICUS.

Caprimulgus asiaticus, Lath. Ind. Orn. ii, p. 588 (1790).

♀ Bangkok, 6.6.15.

This specimen has a wing of 146 mm.

196. CAPRIMULGUS MONTICOLUS.

Caprimulgus monticolus, Franklin, P. Z. S. p. 116, 1831.

♂ Paknampho, 2.12.13. (Wing 192 mm.)

197. LYNCORNIS CERVINICEPS CERVINICEPS.

Lyncornis cerviniceps, Gould, Icon. Av. pt. ii, pl. 14 (1838).

♂ Muak Lek, E. Siam, 24.8.15. (Wing 308 mm.)

South Indian birds have been separated as *L. c. bourdilloni*. They average in wing measurement 279 mm. as against 301 mm. in 20 Burmese birds.

A Luzon bird with a wing of only 277 mm. also differs in being very richly coloured.

198. TACHORNIS BATTASIENSIS INFUMATUS.

Cypselus infumatus, Selater, P. Z. S. 1865, p. 602. (Borneo).

♂ Samkok, C. Siam, 17.3.16.

199. HARPACTES DUVAUCELL.

Trogon duvaucelii, Temm. Pl. Col. pl. 291 (1824).

♂ Tung Song, P. Siam, 17.9.15.

200. HARPACTES ORESKIOS.

Harpactes oreskios, Temm. Pl. Col. pl. 181. (1823).

♂ Hup Bon, S. E. Siam, 21.7.15.

♂ Muak Lek, E. Siam, 23.8.15.

♀ Krabin, C. Siam, 17.11.15.

♂ ♀ Klong Bang Lai, P. Siam, 2.2.16.

The wings of Mr. Herbert's series range from 120 to 128 mm., the female being the largest.

201. PYROTROGAN DIARDI NEGLECTUS.

Pyrotrogan neglectus, Forbes and Robinson, Bull. Liver. Mus. ii, p. 34 (1899).

♂ Tung Song, P. Siam, 13.9.15.

This appears to be the first record of this grand Trogan from so far north as Siam.

202. HIEROCOCCYX SPARVEROIDES SPARVEROIDES.

Hierococcyx sparveroides, Vigors, P. Z. S. 1831, p. 173.

♂ Krabin, C. Siam, 6.11.15.

This is a most beautiful specimen, very pale and brightly coloured with the whole of the upper parts a pale slate-grey with no tinge of brown except to a slight extent on the wing quills. I have never seen a specimen similar to this, and it will be very interesting to ascertain if other Siamese birds attain a similar grey plumage. It is impossible to name a wandering bird such as this is from a single specimen, but more should be obtained.

203. HIEROCOCCYX FUGAX NANUS.

Hierococcyx nanus, Hume Str. Feath. v, p. 490 (1877).

♀ Maprit, P. Siam, 10.1.16.

Wing 145 mm. Apparently the first record of this Cuckoo from Siam.

204. CACOMANTIS MERULINUS MERULINUS.

Cuculus merulinus, Scop. Del. Flor. et Faun. Insubr. ii, p. 89 (1786).

♀ Samray, Bangkok, 16.12.15.

• Hua Takhae, C. Siam, 10.2.16.

Both birds are quite typical *merulinus*.

205. PENTHOCERYX SONNERATI SONNERATI.

Cuculus sonneratii, Lath. Ind. Orn. i, p. 215 (1790). India.

♀ Hup Bon, S. E. Siam, 25.7.15.

The Siamese birds appear to belong to the typical Burmese and Indian form. In the south of Peninsular Siam one would

expect to find the smaller race *P. s. senustus* which ranges from Borneo to Central Tenasserim. The wing in this race averages only 105.7 mm. as against over 122 mm. in typical *sonnerati*.

206. *CHRYSOCCYX MACULATUS MACULATUS*.

Trogon maculatus, Gmelin, Syst. Nat. i, p. 404 (1788).

♀ Samray, Bangkok, 16.12.15.

This is a very pale bird with the sheen on the back plumage light and less green than usual. More material is required to enable one to work out the geographical races of this beautiful little Cuckoo, but two other Siamese birds in the British Museum collection agree fairly well with it.

207. *SURNICULUS LUGUBRIS*.

Cuculus lugubris, Horsf. Trans. Linn. Soc. xiii, p. 179 (1821). Java.

♀ Klong Wang Hip, P. Siam, 30.9.15.

♂ Krabin, C. Siam, 9.11.15.

♂ Pak Jong, E. Siam, 30.11.15.

This Cuckoo will require division into geographical races on two main grounds; comparative length of tail and wing formula. In the Indian and Malayan race the third primary is generally much longer than the fourth, and the first primary is comparatively large; in the Palawan birds the third and fourth primaries are practically equal, and the first primary is very small. Ceylon specimens have the fourth quill longest or subequal, and the first primary large.

Palawan birds also have very short tails; and Ceylon birds very long ones.

208. *EUDYNAMIS HONERATA MALAYANA*.

Eudynamis malayana, Cab. and Heine, Mus. Hein. iv, p. 52 (1862).

2 ♂ ♀ Krabin, C. Siam, 31.10 to 3.11.15.

The wing measurements of these birds are males 203 and 209 mm., and female 215 mm. The male shot on the 3rd has numerous white bars on the wings and tail.

209. *RHOPODYTES TRISTIS LONGICAUDATUS*.

Phoenicophæus longicaudatus, Blyth, J. A. S. B. x, p. 923 (1841). Moulmein.

♂ Samkok, C. Siam, 21.6.15

♂ ♀ Pak Jong, E. Siam, 18.8.15.

♂ ♀ Krabin, C. Siam, 1.11.15.

All five of these specimens must be placed under this sub-species. The stripes on the head and throat are well-developed, there is very little rufous wash on either breast or throat. The white spots on the tail are smaller than in the Sumatran bird, *R. tristis tristis*, and run across the tail at an angle instead of nearly straight.

There are five distinguishable races of this Cuckoo. (1) *R. t. tristis* from Sumatra, (2) *R. t. longicaudatus* from Burma, Siam and Malay Peninsula, (3) *R. t. montanus* from Northern India, Assam to Yunnan, (4) *R. t. hainanus* from Hainan, and (5) *R. t. borneensis* from Borneo.

210. PHŒNICOPHÆS ERYTHROGNATHUS.

Phœnicophæus erythrognathus, Hartl. Verz. Mus. Brem. p. 95 (1844).

♀ Tung Song, P. Siam, 15.9.15.

♂ Klong Wang Hip, P. Siam, 6.10.15.

The wing measurements of these two birds are 171 and 176 mm. respectively. This Cuckoo belongs to that extraordinary group of birds of which it is extremely difficult to say whether they form six genera, six species or merely six geographical races. In colouration they are all practically alike, but might be split up into two or three races on account of variation in depth of colour, etc. On the other hand, they are all structurally different in having nostrils of varying shape and placed quite differently in position on the bill. To me it appears to be one of those rare cases in which structural differences must be held to be of less importance than colour and pattern, and I retain all under the one generic head, and consider them to be species only. They cannot be reduced to sub-species, as there are not connecting links to join the one with another.

211. RHINORTHA CHLOROPHÆA CHLOROPHÆA.

Ouculus chlorophæus, Raffl. Trans. Linn. Soc. xiii, p. 288 (1822).
Sumatra.

♂ Tung Song, P. Siam, 24.9.15.

♀ Maprit, P. Siam, 4.1.16.

Siam birds agree with typical *chlorophæa* from Sumatra. I am not able to distinguish between specimens from Sumatra, Malay Peninsula and Tenasserim. The Bornean birds are distinguishable by the females having the under parts much more rufous. The males hardly differ from those from Sumatra, though they are possibly more richly and brightly coloured on the whole.

212. *CARPOCOCYX RENAULDI*.

Carpococcyx renauldi, Oust. Bull. Mus. Paris, p. 314 (1896).

♂ ♀ Pak Jong, E. Siam, 19.8.15.

This magnificent Cuckoo has hitherto been known only by the single specimen, in the Paris Museum, which was very kindly lent to me for comparison with the above birds.

Oustalet's single bird was obtained in Annam, so that Siam forms a great extension of its habitat. Both specimens are in heavy moult, but have perfect wings and tails, though the latter are not in

ERRATA.

Page 440, line 14. For PHÆNICOPHÆS read PHÆNICOPHÆS.

Do. line 15. For *Phœnicophæes* read *Phœnicophaës*.

with green, upper and coverts deep green blue, tail purple blue, lower parts creamy white, finely vermiculated with bars of grey on flanks and thigh coverts.

213. *CENTROPUS SINENSIS INTERMEDIUS*.

Centroccocyx intermedius, Hume, Str. Feath. i, p. 454 (1873).

♂ Samkok, C. Siam, 21.6.15.

♂ juv. Hup Bon, S. E. Siam, 23.7.15.

♂ ♀ Klong Wang Hip, P. Siam, 2-3.10.15.

♂ Samkok, C. Siam, 21.6.15

♂ ♀ Pak Jong, E. Siam, 18.8.15.

♂ ♀ Krabin, C. Siam, 1.11.15.

All five of these specimens must be placed under this sub-species. The stripes on the head and throat are well-developed, there is very little rufous wash on either breast or throat. The white spots on the tail are smaller than in the Sumatran bird, *R. tristis tristis*, and run across the tail at an angle instead of nearly straight.

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Oustalet's single bird was obtained in Annam, so that Siam forms a great extension of its habitat. Both specimens are in heavy moult, but have perfect wings and tails, though the latter are not in full moult.

The measurements are as follows:—

Wings, 284 and 272 mm.; tails, 330 and 325 mm.; bill from base of forehead to tip, 49 and 48 mm.; tarsi, 98 and 93 mm.; the male is the bigger bird, and the tails are in full moult.

Bill deep coral red, paler at base and on gonys; legs deep coral red, toes and soles paler.

Forehead grey; whole head, neck, upper back and breast black; back, scapulars and lesser wing coverts grey, palest next the black neck and finely vermiculated with dark grey; quills black with a purple sheen; innermost secondaries green-grey, gradually changing to the grey of the coverts; rump strongly tinged with green, upper tail coverts deep green-blue, tail purple-blue; lower parts creamy white, finely vermiculated with bars of grey on flanks and thigh coverts.

213. *CENTROPUS SINENSIS INTERMEDIUS*.

Centrococcyx intermedius, Hume, Str. Feath. i, p. 454 (1873).

♂ Samkok, C. Siam, 21.6.15.

♂ juv. Hup Bon, S. E. Siam, 23.7.15.

♂ ♀ Klong Wang Hip, P. Siam, 2-3.10.15.

♀ Krabin, C. Siam, 12.11.15.

♀ Pak Jong, E. Siam, 3.12.15.

Stresemann has dealt with these Cuckoos at some length in *Novitates Zoologicae*, vol. xx, p. 321, but his geographical ranges are very unsatisfactory. Manipur and Cachar, according to him, are occupied by different races. Mr. Herbert's specimens have the wings varying between 191 and 210 mm. (juv. ♂ 191 mm.) and the bills very large, ranging from 26 to 29 mm. if measured from the edge of the nostril, and up to 39 mm. if measured from the forehead to the tip. They have, of course, the interscapulars red, not black.

214. CENTROPUS BENGALENSIS.

Cuculus bengalensis. Gm. Sys. Nat. i, p. 412 (1788).

♂ ♀ Krabin, C. Siam, 1-6.11.15.

These specimens call for no remark.

215. PALÆORNIS CYANOCEPHALUS CYANOCEPHALUS.

Psittacus cyanocephalus, Linn. Syst. Nat. i, p. 141 (1766).

♂ ♀ Chan Teuk, E. Siam, 12.8.15.

These two birds call for no remark.

216. PALÆORNIS ALEXANDRI FASCIATA.

Psittacus fasciatus, Mull. S. N. Suppl., p. 746. f. (1776).

♂ Samkok, C. Siam, 20.6.15.

♂ ♀ Hup Bon, S. E. Siam, 16.7.15.

♂ ♀ Pak Jong, E. Siam, 16.8.15.

2 ♂ ♂ juv. 2 ♀ Krabin, C. Siam, 3-9.11.15.

The wings of the males run from 149 to 164 mm. and of the females from 143 to 156. The smallest adult male is 155 mm.

These birds are rather small when compared with North Indian and Burmese specimens, but are otherwise exactly similar. The females and young males have the bills wholly black as in true *fasciata*.

217. LORICULUS VERNALIS.

Psittacus vernalis, Sparrm. Mus. Carls., p. 29 (1787).

2 ♂ ♀ Hup Bon, S. E. Siam, 16-27.7.15.

♂ ♀ Pak Jong, E. Siam, 18-21.8.15.

♀ Klong Bang Lai, P. Siam, 20.1.16.

These little Lorikeets call for no remark. They are all quite typical.

It is very doubtful whether *pusillus* from Java, with its yellow throat, should be considered a sub-species of this bird, as the colour of this part in *Loriculus* seems to be of specific value, *i. e.*, bluish in *vernalis*, yellow in *pusillus* and red in *flosculus* and *exilis*, nor does there seem to be any running of the one into the other as one would expect in geographical races.

(*To be continued.*)

ON A NEW FORM OF WHITE-EYE FROM SIAM.

BY H. C. ROBINSON AND C. BODEN KLOSS.

Zosterops palpebrosa williamsoni, subsp. nov.*Zosterops palpebrosa aureiventer*, Stuart Baker (*nee* Hume), *antea*, p. 190.Intermediate between *Z. p. simplex*¹ Swinh., of South China and *Z. p. aureiventer* Hume, of the Malay States (Typical locality, Tavoy).Rump yellower than in *simplex* and a streak of yellow nearly always present on the abdomen.Duller throughout than *aureiventer*; greener, less yellowish above; throat, foreneck and tail-coverts paler yellow; abdominal stripe very much smaller; sides and flanks without any wash of drab.

Type: Adult male from Meklong, Central Siam, obtained on 12th February 1918 by Mr. W. J. F. Williamson's collector.

Dimensions: Tail, 39; wing, 54; tarsus, 15.5; bill from gape 12.5 mm.

Specimens examined: The type and seventeen others from the same locality; one from Koh Rah, Takuapa, West Coast of Peninsular Siam, Feb. 1919; and five from Batu, Selangor, Malay States, Nov. 1906.Compared with fourteen examples of *Z. p. aureiventer* from the Malay States and a specimen of *Z. p. simplex* from Kuakiang, South China.

¹ We have followed Hartert (Vög. Palaark. Faun., 1, 1905, p. 315) in regarding *simplex* as a subspecies of *Z. palpebrosa* (Temm.).

NOTES ON SOME RECENTLY DESCRIBED SIAMESE BIRDS.

BY C. BODEN KLOSS, M. B. O. U.

When I obtained the mammals with which I have just dealt, I also made a collection of birds of which I have given an account in "Ibis", January and April, 1918. In the October number of the same volume Mr. E. C. Stuart Baker criticised some of my conclusions and has repeated his views in his recent paper dealing with Mr. E. G. Herbert's collection in this Journal (Vol III, No. 3, August 1919, pp. 177-216),

These notes are a reply to some of Mr. Baker's comments. While he seems to me to have proved a most successful discoverer of mares'-nests (in the matter of *V. polioptera*, *O. f. minor*, *C. s. koratensis*, etc.), when I propose a really bad race he fails to convict me of error. *Dicrurus annectens siamensis* (Ibis, 1918, p. 226) now appears to me, with a good deal more material for examination and comparison, to be not only not a new form at all, but even to have nothing to do with *annectens*. It is merely *Buchanga atra cathæca* (Swinh.) of S. E. China. The matter will be dealt with later.

Graucalus macei macei, Kloss, Ibis 1918, p. 192.

Graucalus macei siamensis, Baker, Ibis 1918, p. 596; id. Journ. N. H. Soc. Siam, III, 1919, p. 208.

My only specimen, being a male, could not be distinguished from the typical form; it is, of course, the bird since described as *G. m. siamensis* by Mr. Baker (Bull. B. O. C., xxxviii, p. 69) on account of colour differences in the female.

But is that name tenable? Baker himself says that the Siamese bird is the same as the Hainan one and the latter has already been separated by Hartert as *Graucalus macei larvivorus* [Nov. Zool. xvii (1910), p. 227].

Volvocivora koratensis and **V. polioptera**, Kloss, t. c., pp. 193-4.

Volvocivora intermedia and **V. neglecta**, Baker, Ibis 1918, pp. 596-7.

Campophaga melanoschista intermedia and **C. neglecta**, Baker, Journ. t. c., p. 207.

This genus has never been satisfactorily reviewed—a proceeding that is much called for—and the uncertainty which exists regarding the status of some of its birds and their names makes unanimity on the part of independent workers difficult.

Mr. Baker may, of course, be correct in his condemnation of my *first* determination, but at present he is regarding all birds, not seen by him, as similar to specimens obtained by another collector in another locality—scarcely a safe conclusion in this instance.

Hume's description of *intermedia* is very indirect, and as my *koratensis* is called into question and referred to it, I will not express an opinion again until I have examined and compared further material.

Mr. Baker says that the birds I have called *polioptera** are young specimens of *neglecta*. Perusal of Hume's original description of this form (Stray Feathers, V, 1877, pp. 203-5) based on "numerous lovely specimens" shows that its wing-length ranges from 96 to 106 mm. The types of *polioptera* had wings of 104 and 106 mm; my Siamese birds were rather larger, as I pointed out (wings measured flattened 109—112 mm.), but Sharpe's two specimens do not, of course, indicate the variation in size of his form. If Hume has fairly indicated the size of *neglecta* (and I know of no larger dimensions on record) it is impossible to believe that the greater are young examples of the lesser.

I have accepted as *neglecta* a number of specimens from Peninsular Siam having Hume's measurements, and only radically differing from *culminata* Hay, of the Malay States, to which Oates rightly says it is allied, in having the vent and undertail coverts white instead of grey, as he notes (Fauna Brit. Ind., Birds, 1, p. 493).

Hume mentions no white on the inner webs of the primaries in *neglecta*: on the other hand, *polioptera* has the inner webs broadly white. The birds which I allocate to these two agree respectively in these particulars: the latter has much larger white tips to

* The references to Ogilvie Grant (Ibis 1918, p. 597, line 14: *lege* Kloss) and to Herbert (Ibis 1918, p. 594, line 11: *lege* Hartert) are no doubt slips of the pen, but do not help to make Mr. Baker's meaning clearer.

longer and largely grey (instead of black) tail feathers, and there are other differences as well—such as wing black with a greenish sheen in the first, length 96-106 mm; largely grey in the second, length 104-112 mm.

If my birds are not *polioptera* as I think, I feel I can say with some certainty that they are not *neglecta*, young or old, as Baker states.

The specimens seen by Baker from Tung Song and Klong Wang Hip, Peninsular Siam, are, no doubt, *neglecta* and similar to those I have before me from the same district; but I should hardly be prepared to call that a species. It is, with the more southern mainland form *culminata*, only a race of the Javanese *fimbriata* of Temminck; and the generic name of all these now appears to me to be properly *Lalage*.

The truth, which Baker does not realise, is that two distinct birds exist—the smaller and generally darker *neglecta* ranging from Mergui in South Tenasserim (typical locality) through Peninsular Siam, but becoming *culminata* in the Malay States: and the larger and more variegated *polioptera* extending from Cochin-China (typical locality) to Northern Siam and to Koh Lak in South-western Siam.

Pycnonotus blanfordi robinsoni, Kloss, t. c., p. 200.

Pycnonotus blanfordi blanfordi, Baker, Ibis 1918, p. 595.

Pycnonotus blanfordi, Baker, Journ., t. c., p. 197.

Mr. Baker considers that these names are synonymous, but such material as I have been able to examine shows otherwise, though *P. b. robinsoni* is not, I admit, a strongly differentiated form. I have, however, found it locally consistent.

Otocompsa flaviventris minor, Kloss, t. c., p. 200.

Otocompsa flaviventris johnsoni, Baker, Ibis 1918, p. 597; id, Journ., t. c., p. 194.

Mr. Baker agrees that my type specimen of *O. f. minor* differs in smaller size from the typical *O. f. flaviventris* and I said, when proposing a new race, that it was the same as birds occurring throughout the Malay Peninsula as shown by the examination of a

large series from that area, none of which, of course, are red-throated birds. It is thus *not* based on one bird only.

It is now suggested, however, that the specimen was a young example of *Rubigula johnsoni* (Gyldenstolpe, and that I should concur if I saw the series Baker had before him. But when I described *O. f. minor* there were available in my own collection a very fair number of topotypes of *R. johnsoni* (vide *Otocompsa flaviventris johnsoni* Kloss, l. c. s.); sufficient, at any rate, for Baker to adopt, without comment, my amendment as to its generic position and specific name!

My definition of South-west Siam is the region between Petchaburi and the Isthmus of Kra (t. c., p. 78): this, I presume, Baker accepts, and I shall be glad to learn from what places in that area Mr. Herbert has obtained unquestionable (i. e., red-throated) specimens of *O. f. johnsoni*, which Baker states is common there. No one else has recorded it and the distribution now indicated for the forms of the species is, at least, interesting—the remarkable red-throated *johnsoni* inserting itself between two black-throated forms which are only separable on the character of size!

Of the eighteen specimens listed by Baker in this Journal as *O. f. johnsoni*, I suggest that only those from Pak Jong, Hinlap and possibly, Krabin, are examples of the red-throated subspecies. I think that the latter is practically confined to the Korat region (i. e., Eastern Siam): apparently it does not occur in South-eastern Siam, nor has it been recorded from anywhere in French Indo-China.

Setaria lepidoccephala, Kloss, t. c., p, 203.

Setaria rufifrons, Baker, Ibis 1918, p. 594; id. Journ. t. c., p. 186.

I listed my birds as *S. lepidoccephala* (Gray) because the maximum wing-length of the series was 74 mm., while Finseh, who examined the type of *S. rufifrons*, records it as 80 mm. Mr. Baker gives a translation of the original description of *rufifrons* in which the wing is stated to be 3 inches and, transposing this to 76.2 mm., says that the latter name is applicable and must stand for the birds under discussion.

He has not, however, realised that Cabanis and Heine would

have used the old continental inch which is about 2 mm. larger than the English one. Finsch is therefore probably correct after all, and until the point is decided against him I shall prefer to remain faithful to my own selection of a name.

Mixornis rubricapilla sulphurea, Kloss, t. c., p. 204.

Mixornis sumatrana rubricapilla, or *M. s. minor*, Baker, Ibis 1918, p. 595; id., Journ., t. c., p. 189.

Mr. Baker says that *Stachyridopsis sulphurea* Rippon is *Mixornis rubricapilla* pure and simple. If this is correct then *M. minor* Gyldenstolpe is a good form. I accepted an assurance that the first and last are the same thing.

I have not seen either the type or exact topotypes of *sulphurea*, as Baker apparently has, but a series of *minor* differs noticeably from a topotype of *rubricapilla* with which I have compared it (vide Ibis 1918, p. 206, under *M. r. sulphurea*).

Two forms, at least, occur in Siam, and it is not clear which Baker is unable to distinguish from true *rubricapilla*: *sulphurea* or *minor* is found in the north and east, and *connectens* in the south-west, south and south-east: I have also recently obtained the latter in Cochin-China and South Annam.

I did not point out that *sumatrana* is the oldest and, therefore, must be the specific name for this bird (that is Mr. Baker's opinion) for it is not: but I regretted that, contrary to accepted practice, it could not be used specifically, for I should like to see the first known form held to be typical of the species whatever the name it might eventually have to be called by. Surely this is more safe and logical than typifying the species by a later-known form, and involves no greater change in nomenclature.

Prinia inornata blanfordi, Kloss, t. c., p. 211.

Prinia inornata herberti, Baker, Ibis 1918, p. 595; id., Journ., t. c., p. 203.

As Mr. Baker discovered his first error with regard to this bird, so lately have I also seen mine. My own specimens were in worn plumage and were determined with doubt, as was noted at the time; but I have since seen good examples from Siam collected by Mr. Williamson who wrote that they were typical of the bird named

P. i. herberti, subsp. nov. In bestowing this name upon it Baker seems to have made a second mistake.

I suggest that the bird is only the Javanese *Prinia polychroa* (Temm.), [Sharpe, Cat. Birds Brit. Mus. vii, p. 202], with several good specimens of which I have compared the Siamese skins.

Chalcoparia singalensis koratensis, Kloss t. c., p. 218.

Chalcoparia singalensis singalensis, Baker, Ibis 1918, p. 596 (*ab inferentio*).

The more I see of this species (and the number of specimens now available from both south and north is considerably greater than when I proposed the new race), the more I am assured that two good forms exist.

The make-up of skins might be responsible, as Mr. Baker suggests, for what I will call fictitious disposition of pattern, but not for fictitious tones of colour, and I do not consider that the attempt to explain away differences, which were at first unhesitatingly accepted, is well judged.

The Tenasserim birds mentioned by Tweeddale are probably the same as the Siamese, for I now think that author accidentally reversed some of the localities when writing, using northern for southern and vice versa.

Buchanga atra longus, Kloss, Ibis, t. c., p. 227.

Dicrurus ater longus, Baker, Nov. Zool., xxv, 1918, p. 299.

I am sure that neither this race, nor any one allied to it, occurs in "the extreme south and east of the Malay Peninsula", as stated by Baker.

Buchanga leucophæa, Kloss, Ibis, t. c., p. 227.

Dicrurus leucophæus leucophæus, Baker, Nov. Zool, t. c., p. 293.

Mr. Baker says that "birds from Johore and Singapore are undoubtedly true *leucophæus*" (line 5 from bottom of page). This also is a statement that must be challenged: I do not think that the form occurs in either locality or anywhere near by.

Dissemurus paradiseus paradiseus, Kloss, t. c., p. 228; Baker (*partim*), Nov. Zool., t. c., p. 300.

This name was based by Linnaeus on material from Siam, but now-a-days such a broad typical locality is much too indefinite in

this instance: I therefore restrict it to the region between Ayuthia and the head of the Gulf. The race extends down the Malay Peninsula about as far as Mergui, and has a fairly large crest, when fully developed.

Dissemurus paradiseus malayensis, Kloss, t. c., pp. 229, 518.

Dissemurus paradiseus paradiseus, Baker (*partim*), Nov. Zool., t. c., p. 300.

This form, founded by Blyth on Penang birds, occurs throughout the Malay Peninsula from about Mergui to Perak. It has a smaller crest and wing than the typical race found round Bangkok and is quite worthy of the recognition which Baker fails to accord it.

NOTE ON A COLLECTION OF ODONATA FROM SOUTH ANNAM.

BY MAJOR F. C. FRASER, I. M. S.

(With one text-figure).

INTRODUCTION

The collection, which contains 119 specimens and has representatives of 34 species or about one fourth of the Odonate fauna of South Annam, is fairly representative of that part of Indo-China, although the smaller forms of *Zygoptera* are not in evidence. There appears to be one new species in the list which is detailed below, and I am a little in doubt with regard to an *Anotogaster* of which a female is the sole representative of its genus in the collection, and a very teneral male of *Megalestes* which was so compressed in the paper packet that it was impossible to make out the formation of the anal appendages.

[The small collection of Dragonflies which Major Fraser has kindly determined for us was made by Dr. Malcolm Smith and myself during a visit to South Annam in the spring of 1918.

Our camp at Daban was pitched near the Kronfa river where it makes exit from the mountains of Langbian, and when we went to bathe in its clear waters running among rocks and boulders it was our custom to take a net with us on account of the beautiful insects that flitted over the river; such were Nos. 24, 25, 27, 28, 29, 30.

Most of the other species from Daban were taken along a path running between the river and the forest through a patch of coarse grass-land interspersed with saplings and bushes; these were Nos. 1, 3, 4, 5, 6, 8—18, 20—22, 32—34. The species of *Neurothemis* were very common and mixed together in this place, perching on twigs and grass stems.

The few examples from Dran (Nos. 7, 15, 23, 26) were taken in grass country near water. Dalat, whence came Nos. 2, 9, 19 and 26, is grass country covered with pine forest.

The camp on Langbian Peaks was set on a grassy slope at the edge of mixed forest (No. 31).

Tour Cham is in the coastal plain of Phanrang; short grass dotted with thorny bushes (No. 33).

Collecting insects did not come within the plan of our visit to Annam and it was the beauty of the *Calopteryginae* that inspired us to begin capturing them. I regret that I have to trust to memory for the few details of habitat given above.

C. BODEN KLOSS.]

SYSTEMATIC.

ORDER. ODONATA.

Suborder. ANISOPTERA.

Family. AESCHNIDAE.

Subfamily. CORDULEGASTERINAE.

Genus ANOTOGASTER.

1. ANOTOGASTER KLOSSI, sp. nov.

One ♀.

The insect is in a dirty condition and I surmise that it was taken in the act of oviposition, as members of the genus are accustomed to descend into water for this purpose and so often get more or less soiled with mud in the process. It is of great dimensions, the total expanse being 140 mm., the length 118 mm., hindwing 67 mm., and abdomen including ovipositor 80 mm.

Head: eyes green, rest of head blackish brown marked with yellow as follows:—A streak across the face involving the lower part of epistome, the attached border of labrum and a large spot on the lateral lobes of the labium. The edge of the occiput is fringed densely with short, stiff, black hairs.

Prothorax blackish brown with a pyriform, subdorsal spot of yellow on each side.

Thorax dark brown marked with yellow:—a wedge-shaped antehumeral spot with the base upwards, approximating to its fellow above and diverging below, a broad stripe at the side, and the metepimeron largely yellow.

Abdomen a tawny yellow with the internodal joints and the area immediately in front of them brownish black. Legs black. Ovipositor very robust,

Wings hyaline, the basal portions richly saffronated to about halfway to node, the free border of this area curving obliquely back to the tornus. Antenodal nervures in forewing 27, postnodal nervures 19, antenodal nervures in hindwing 18, postnodals 20, 4 cells in trigone of forewing, 3 in that of the hind. Stigma black.

Taken at Daban, 650 ft, Phanrang Province, March 1918.

Genus *ICTINUS*.

2. *I. RAPAX*.

One ♂. Daban, 650 ft., Phanrang Province, March 1918.

Genus *MACROGOMPHUS*.

3. *M. ANNULATUS* Selys.

One ♂. Taken at Dalat, 5000 ft., Langbian Province, April-May 1918.

FAMILY LIBELLULIDAE.

Subfamily CORDULINAE.

Genus *MACROMIA*.

4. *M. GERSTAKERI* Kruger.

One ♂. Daban, 650 ft., Phanrang Province, March, 1918.

Subfamily LIBELLULINAE.

Genus *LATHRECISTA*.

5. *L. ASIATICA ASIATICA* Ris.

One ♂ and one ♀. Daban 650 ft., March 1918.

The markings in this pair are very bright and distinct. The apices of the wings are tipped with brown and there is some saffronation along the costal margins. The specimens conform to the wet season type.

Genus *ORTHETRUM*.

6. *O. SABINA* Kirby.

One ♂ only. Daban, 650 ft., Phanrang Province, March, 1918.

7. *O. PRUINOSUM* Kirby. One ♂. Dran, 3,000 ft., Langbian Province, March 1918.

Genus *BRACHYDIPLAX*.

8. *B. FARINOSA* Kirby.

One ♂, Daban, 650 ft., Phanrang Province, March 1918.

The specimen appears to be fully adult but bears only the slightest trace of pruinescence on the thorax and none at all on the abdomen. The colour of the latter and thorax is a golden or reddish brown.

Genus *DIPLOCODES*.

♀. *D. TRIVIALIS* Rambur.

Two ♂ and one ♀. Same locality as the last.

Genus *NEUROTHEMIS*.

10. *N. INTERMEDIA INTERMEDIA* Ris.

Five ♂ and four ♀. The basal marking in the males is of a very light colour.

11. *N. FLUCTUANS* Hagen.

Three ♂. The colour of the wing varies from a rich shade of amber to a deep chocolate brown, apparently due to the varying ages of the specimens. The extent is about the same in all.

12. *N. TULLIA TULLIA* Kirby.

One ♂ only,

13. *N. TULLIA FERALIS* Selys.

One ♂ and one ♀.

14. *N. FULVIA* Drury.

One ♀ and four ♂. The specimens are unusually small as compared with Indian species. The males have only the extreme tip of the wings tipped with brown, the hyaline space adjoining being correspondingly enlarged, thus resembling species from Burma. This feature appears to be constant and if the type specimen is from Bombay, they must be regarded as a distinct variety. The ♀ is the smallest I have seen of its kind. All the above five specimens of *Neurothemis* were taken at Daban, Phanrang Province, 650 ft. March 1918.

Genus *CROCOTHEMIS*.

15. *C. SERVILIA* Brauer.

Two ♂. Same locality as the last.

16. *C. ERYTHRAE* Brauer.

One teneral ♂. Daban, 650 ft., Phanrang Province, March

1918. Teneral species of this insect so closely resemble *servilia* that this may possibly be a teneral form of that species.

Genus BRACHYTHEMIS.

17. B. CONTAMINATA Brauer.

Eight ♂ and four ♀, taken in the same locality as the last.

Genus ZYGONYX.

18. Z. IRIS Selys.

Three ♂ and one ♀.

Genus TRITHEMIS.

19. T. FESTIVA Brauer.

One ♀ only. Dalat, 5000 ft., Langbian Province, April-May 1918.

The altitude at which this insect was taken is greater than usual, it being essentially a plains species. From 3000-4000 ft. is its limit in Ceylon and India.

Genus HYDROBASILEUS.

20. H. CROCEUS Karsch.

One ♀ only. Daban 650 ft., Phanrang Province, March 1918.

Genus THOLYMIS.

21. T. TILLARGA Hagen.

One ♂ only. From the same locality as the last.

Genus RHYOTHEMIS.

22. R. PHYLLIS PHYLLIS Hagen.

One ♂ and one ♀. From same locality as last.

23. R. PLUTONIA Selys.

One ♂. Dran, 3000 ft., Langbian Province, March-May 1918.

SUBORDER ZYGOPTERA.

Family CALOPTERYGIDAE.

Subfamily CALOPTERYGINAE.

Genus NEUROBASIS.

24. N. SINENSIS, Linn.

Three ♂. Daban 650 ft., Phanrang Province, March 1918.

Genus VESTALIS.

25. *V. APICALIS* Selys.

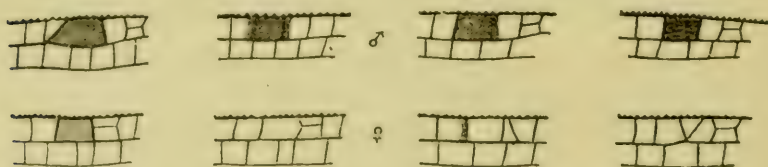
Six ♂ and seven ♀. The apical marking varies in density but none of the specimens are as dark as specimens from Malabar, India.

Genus MNAIS.

26. *M. EARNSHAWI* Williamson.

Four ♂ and four ♀. Some of the specimens are in a teneral condition. From Dran 3000 ft. and Dalat 5000 ft., Langbian Province, March to May, 1918.

The eight specimens of this very interesting insect exhibit well the remarkable polymorphism of the rudimentary pterostigma, which is clearly undergoing a gradual reduction. Indeed, by a comparative examination of the material at hand, it is possible to trace the complete process of reduction from a moderately large and well-defined pterostigma to a complete obsolescence as found in *Vestalis*. In the same specimen, the pterostigma is seen to vary in all 4 wings,



Pterostigma of *M. earnshawi*, arranged in series to show the gradual reduction which is taking place.

especially in the females, in one of which it is entirely absent and in two other wings it is merely indicated by the faintest shading about one of the postnodal, apical nervures. In other wings, it is of the palest grey or entirely hyaline so that some difficulty is experienced in determining which cell represents the pterostigma. In the males it is a deep blood-red and may overflow its bordering nervures so that it appears to be traversed by the same. In reality this appearance is apparently due to a gradual contraction in the size of the stigma so that the bordering nervures are being left behind, a pro-

cess which is taking place both proximally and distally. In one of the females the process of reduction is being helped by an approximation of the bordering nervures so that it is seen to be triangular in shape due to the nervures having met posteriorly.

Genus PSEUDOPHOEA.

27. *P. VARIEGATA* Rambur.

Five ♂ and two ♀.

28. *P. MASONI* Selys.

Eleven ♂. Both species from Daban, 650 ft., Phanrang Province, March, 1918.

Genus RHINOCYPHA.

29. *R. FULGIDIPENNIS* Guerin.

Five ♂ and two ♀.

30. *R. PERFORATA PERFORATA* Percheron.

Two ♂: Both species from the same locality as the last.

FAMILY LESTIDAE.

Subfamily LESTINAE

Genus MEGALESTES.

31. *M. MAJOR* Selys.

One teneral ♂. Langbian Peaks, 6000 ft., South Annam, April, 1918. The species is doubtful as the specimen is very teneral and much compressed in the paper packet.

Genus LESTES.

32. *L. VIRIDULA* Rambur.

Two ♂ and one ♀. Dran 3000 ft., Langbian Province, March-May, 1918.

FAMILY AGRIONIDAE.

Subfamily AGRIONINAE

Genus ISCHNURA.

33. *I. SENEGALENSIS* Rambur.

Four ♂ and two ♀. Tour Cham, Phanrang Province, March-May, 1918. Sea level.

GENUS CERIAGRION.

34. *C. ERUBESCENS* Selys.

Two ♀ and one ♂. Daban, 650 ft., Phanrang Province, March 1918.

ON BUTTERFLIES COLLECTED BY MALCOLM A. SMITH AND
C. BODEN KLOSS IN SOUTHERN ANNAM.

By E. J. GODFREY, B. Sc., F. E. S.

The collection of which an account is given in this paper was made by Dr. Malcolm Smith and Mr. Boden Kloss during the course of an expedition to the Lang Bian plateau, S. Annam, French Indo-China.

The collecting stations to which reference is made were:—

(1) Daban	650	feet.
(2) Sui Kat (Dran)	3000	„
(3) Dalat	5000	„
(4) Lang Bian peaks	6000	„

Owing to the fact that the collecting of butterflies was only a secondary object of the expedition the series obtained was not a very large one, but several specimens of considerable interest were secured.

Herr Fruhstorfer, who with a number of trained collectors visited much the same district in 1901, has recorded in Seitz's "Macro-lepidoptera of the World" a number of butterflies of the country. I have combined the results of the expedition of Smith and Kloss with Fruhstorfer's records in Seitz.

It should, however, be understood that the "Macro-lepidoptera of the World" is incomplete and does not include the *Lycanidæ* and *Hesperiidæ*.

FAMILY PAPILIONIDÆ.¹

1. *PAPILIO ARISTOLOCHIÆ GONIOPELTIS* Rothsch.

Thirteen specimens, Daban.

Not recorded from Annam by Jordan.

2. *PAPILIO CLYTIA PAPONE* Westw.

One specimen, Daban.

¹ Jordan also records from Annam;—

Papilio castor phanrangensis Fruhst. (The Siamese race is *P. castor mahadeva* Moore.)

Papilio antiphates pompilius Fabr.

Papilio doson axion Fldr. (= *eurypylus* Hbn.)

Leptocircus meges virescens Btlr.

Not recorded from Annam by Jordan.

3. *PAPILIO DEMOLEUS MALAYANUS* Wall.

Two specimens, Daban.

Jordan (Seitz, *Macro-lep.* 9, p. 48.) states that some of the specimens obtained by Fruhstorfer in Annam are distinguished by specially broad patches. These are known as *ab. annamiticus* Fruhst.

4. *PAPILIO POLYTES POLYTES* Linn.

Two specimens, Daban.

Not recorded from Annam by Jordan.

5. *PAPILIO AGETES AGETES* Westw.

One specimen, Sui Kat.

6. *PAPILIO NOMIUS SWINHOEI* Moore.

Two specimens, Dalat.

FAMILY PIERIDÆ²

7. *LEPTOSIA XIPHIA XIPHIA* Fabr.

Two specimens, Daban.

8. *DELIAS DESCOMBESI LEUCACANTHA* Fruhst.

One specimen, Sui Kat.

Not recorded from Annam by Fruhstorfer.

9. *DELIAS AGLAIA THYRA* Fruhst.

One specimen, Dalat.

10. *HUPHINA NERISSA DAPHA* Moore.

Four specimens, Daban.

Not recorded from Annam by Fruhstorfer.

11. *HUPHINA NADINA NADINA* Luc.

Two specimens, Daban.

12. *APPIAS LIBYTHEA ZELMIRA* Cr.

Two ♂, one ♀, Daban.

13. *APPIAS LYNCEA HIPPOIDES* Moore.

² Fruhstorfer also records from Annam :—

Delias agostina annamitica Fruhst.

Prioneris thestylis jugurtha Fruhst.

Ixias pyrene annamitica Fruhst.

Terias lacteola lacteola Dist.

Pareronia valeria hippia Fabr.

One ♀, Daban.

14. *APPIAS ALBINA CONFUSA* Fruhst.

Two ♀, Daban.

Not recorded from Annam by Fruhstorfer.

15. *TERIAS LÆTA PSEUDOLÆTA* Moore.

Three specimens, Daban.

16. *TERIAS BLANDA DAVIDSONI* Moore.

Five specimens, Daban.

17. *GANDACA HARINA BURMANA* Moore. (= *ANNAMICA* Moore).

Two specimens, Daban.

FAMILY NYMPHALIDÆ.

Sub-family DANAINÆ³

18. *DANAIS CHRYSIPPUS CHRYSIPPUS* Linn.

Two specimens, Daban.

19. *DANAIS PLEXIPPUS PLEXIPPUS* Linn.

Three specimens, Daban.

20. *DANAIS MELISSA SEPTENTRIONIS* Btlr.

Two specimens, Daban.

21. *DANAIS AGLEA PIORMION* Fruhst.

Two specimens, Daban.

22. *DANAIS SIMILIS PERSIMILIS* Moore.

Two specimens, Daban.

A wet-season aberration found in Annam and Tonkin is known as ab. *hyria* Fruhst.

23. *EUPLEA GODARTI* Luc. (= *SIAMENSIS* Fldr.)

Six specimens, Daban.

24. *EUPLEA HARRISI HARRISI* Fldr.

Seven specimens, Daban.

25. *EUPLEA MULCIBER MULCIBER* Cr.

Four specimens, Daban.

³ Fruhstorfer also records from Annam :—

Euplœa deione limborgi Moore.

Euplœa diocletianus diocletianus Fabr.

Sub-family SATYRINÆ¹

26. YPITHIMA HUEBNERI HUEBNERI Kirby.

One specimen, Daban.

27. YPITHIMA BALDUS BALDUS Fabr.

Two specimens, Daban. These are of the dry-season form which Fruhstorfer calls *marshalli* Btlr.

28. LETHE EUROPA NILADANA Fruhst.

Two specimens, Daban.

Not recorded from Annam by Fruhstorfer.

29. LETHE MINERVA subsp?

Fruhstorfer (Seitz, Macro-lep. 9, p. 318.) divides the species into two races: *minerva* Fabr., from Java and Sumatra, and *tritogenia* Fruhst., from Tenasserim and Burma. The two specimens obtained are most probably referable to the latter race, as also are Siamese specimens.

30. LETHE MEKARA subsp?

One specimen, Daban.

This agrees exactly with Siamese specimens sent by me to the British Museum, and is probably referable to the race *crijnana* Fruhst. from Tonkin which Fruhstorfer says is probably distributed to Tenasserim.

31. MYCALESIS MINEUS MINEUS Linn.

Nine specimens, Daban.

32. MYCALESIS PERSEOIDES PERSEOIDES Moore.

One specimen, Daban.

33. ORSOTRILENA MEDUS Fabr.

One specimen, Daban.

Not recorded from Annam by Fruhstorfer.

34. MELANITIS ZITENIUS subsp?

Seven specimens, Daban. These correspond with Siamese specimens sent by me to the British Museum, but not yet identified.

35. ELYMNIA HYPERMNESTRA UNDULARIS Drury.

One specimen, Daban.

¹ Fruhstorfer also records from Annam :-

Ypthima asteropz annamitica Fruhst.

Mycalesis gotama charaka Moore.

Melanitis phedima ganypati Fruhst.

Sub-family MORPHINÆ.

36. FAUNIS EUMEUS INCERTA Stgr.

Two specimens, Lang Bian peaks.

37. DISCOPHORA CONTINENTALIS SEMINECHO Stich.

One badly damaged specimen, Dalat.

Sub-family NYMPHALINÆ.⁵

38. ERGOLIS MERIONE PHARIS Fruhst.

Two specimens, Daban.

39. CUPHA ERYMANTHIS LOTIS Sulz.

One specimen, Daban.

40. ATELLA PHALANTA PHALANTA Drury.

One specimen, Daban.

41. PRECIS IPHITA IPHITA Cr.

Four specimens, Daban.

Not recorded from Annam by Fruhstorfer.

42. PRECIS ATLITES ATLITES Linn.

One specimen, Daban.

43. PRECIS ALMANA ALMANA Linn.

One specimen, Daban.

Not recorded from Annam by Fruhstorfer.

44. PRECIS LEMONIAS LENARIA Fruhst.

Three specimens, Daban.

45. CYRESTIS THYODAMAS THYODAMAS Bsdv.

One specimen, Daban.

46. RAHINDA HORDONIA HORDONIA Stoll.

Two specimens, Daban.

Fruhstorfer distinguishes between two seasonal forms: *hordonia* Stoll., referring to the w. s. f., and *plagiosa* Moore to the d. s. f.

47. RAHINDA PARAKA ASSAMICA Moore.

One specimen, Daban.

48. NEPTIS HYLAS ACERIDES Fruhst.

Twelve specimens, Daban.

Fruhstorfer distinguishes between two seasonal forms :
sangaica Moore and *acerides* Fruhst.

49. NEPTIS MIAH NOLANA Druce.

One specimen, Daban.

50. PANTOPORIA PERIUS PERIUS Linn.

One badly damaged specimen, Daban.

51. LEBADEA MARTHA Fabr.

One specimen, Daban.

Fruhstorfer distinguishes between two seasonal forms :
martha Fabr., referring to the w. s. f. and *attenuata* Moore, to the
 d. s. f.

52. PARTHENOS SYLVIA APICALIS Moore.

One specimen, Sui Kat.

53. EUTHALIA DIRTEA JADEITINA Fruhst.

One ♂, Sui Kat.

Not recorded from Annam by Fruhstorfer.

54. EULEPIS EUDAMIPPUS NIGROBASALIS Lathy.

One specimen, Sui Kat.

Not recorded from Annam by Fruhstorfer.

FAMILY NEMEOBIDÆ.

55. ZEMEROS FLEGYAS Cr.

Two specimens, Daban.

5 Fruhstorfer also records from Annam :—

Penthema darlisa annamitica Fruhst.

Cethosia biblis viridiana Fruhst.

Cethosia cyane euanthes Fruhst.

Symbrenthina hippoclus daruca Moore.

Precis orithya ocyale Hbn.

Cyprestis cocles cocleoides Fruhst. (The Siamese race is *C. cocles*
cocles Fabr.)

Chersomesia risa transiens Mart.

Neptis magadha annamitica Fruhst.

Neptis soma pseudodipala Fruhst. (The Siamese race is *N. soma*
tushita Fruhst.)

Neptis columella martabana Moore.

Euthalia julii indochinensis Fruhst. (The Siamese race is *E. julii odi-*
lina Fruhst.)

Euthalia kesava sastra Fruhst. (The Siamese race is *E. kesava*
dicipilota Moore)

Euthalia evelina annamita Moore.

56. *TAXILA THUISTO* EPHORUS Fruhst.

One specimen, Daban.

57. *ABISARA META SIAMENSIS* Fruhst,

One specimen, Daban.

FAMILY LYCÆNIDÆ.

Sub-family LYCÆNINÆ.

58. *NEOPITHECOPS ZALMORA* Btlr.

Two specimens, Daban.

59. *CASTALIUS ROSIMON* Fabr.

One specimen, Sui Kat.

60. *CASTALIUS ROXUS ANGUSTIOR* Stand.

One specimen, Daban.

61. *ZIZERA GAIKA* Trimen.

Two specimens, Daban.

62. *CYANIRIS PUSPA IMPERATRIX* Btlr.

One specimen, Daban.

63. *LYCÆNESTHES EMOLUS* Godart.

One specimen, Daban.

64. *LAMPIDES CELENO* Cr.

One specimen, Sui Kat.

65. *CATOCHRYSOPS STRABO* Fabr.

One specimen, Daban.

Sub-family THECLINÆ.

66. *APHNÆUS SYAMA PEGUANA* Moore

One specimen, Daban.

Sub-family ARHOPALINÆ.

67. *ARHOPALA CENTAURUS* Fabr.

Three specimens, Daban.

68. *ARHOPALA ALEA* Hew.

One specimen, Daban.

Sub-family DEUDORIGINÆ.

69. *CAMENA COTYS* Hew.

Two specimens, Daban.

70. *CHERITRA FREJA* Fabr.

Ten specimens, Daban.

71. *LOXURA ATYMNUS* Cr.

One specimen, Daban.

FAMILY HESPERIIDÆ.

Sub-family HESPERINÆ.

72. *ODONTOPTILUM ANGULATA* Fldr.

One specimen, Daban.

73. *TAGIADES ATTICUS* Fabr.

Two specimens, Daban.

Sub-family PAMPHILINÆ.

74. *AMPITTIA MARO* Fabr.

One specimen, Daban.

75. *ASTICTOPTERUS OLIVASCENS* Moore.

Two specimens, Daban.

76. *NOTOCRYPTA FEISTHAMELII* Bsdv.

Two specimens, Daban.

77. *LOTONGUS CALATHUS* Hew.

Two specimens, Daban.

78. *HALPE MOOREI BETURINA* Fruhst.

One specimen, Sui Kat.

79. *PARNARA MATHIAS* Fabr.

Three specimens, Daban.

80. *PARNARA AUSTENI* Moore.

One specimen, Daban.

81. } These correspond with Siamese specimens of mine
 82. } numbered [284] and [386] respectively, sent to the

British Museum but not yet identified.

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